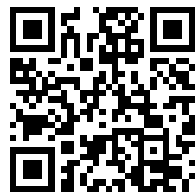

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ERRATA.

IN JOURNAL No. 49—VOLUME 10.

In the Article on Tirah, a foot note should have been appended stating that the topographical information was chiefly obtained from such sources as the reports of Majors Conolly, Plowden and Tucker, Mr. G. B. Scott and Mr. Merk. The map appended was a reproduction, on a reduced scale, of Mr. Scott's map of Tirah.

In the article on Musketry, pages 136 and 137, in marginal headings of paragraphs 3 and 5 of Note by Major-General Maunsell, C. B., for "simple work" read "simple rule."

UNITED SERVICE INSTITUTION OF INDIA.

NOTICE.

The Council have decided to present the Gold Medal for next year for the best Essay on "Strategical Measures best adapted for enabling our troops to meet an army provided with artillery and all the modern arms of precision beyond our North West Frontier."

The following are the conditions of competition.

1. The candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 pages of the size and style of the Journal.
3. Essays must be received by the Secretary on or before the 1st May 1882.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the candidate inside.
5. The Essays will be submitted for decision to referees chosen by the Council.
6. The name of the successful candidate will be made known at the Annual meeting and his Essay will be printed in the Journal.

By Order of Council,
A. D. ANDERSON, CAPT., R. A.,
Honorary Secretary.

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The Council give notice that Life Members to the Institution will be admitted on the following terms:—

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By order of the Council,

A. D. ANDERSON, CAPT., R.A.,

Honorary Secretary.

SIMLA, }
March 1882. }

NOTICE.

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Officers who may wish to become members are requested to be kind enough to forward their donations and subscriptions at the same time as they express a wish to join the Institution.

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The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

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Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an index to Volumes I, II, III, IV, V, VI, VII, VIII and IX, to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Honorary Secretary.

ORIGINAL PAPERS.

I.

PART. III.

CONTINUATION OF PAPER ON THE NAGA HILLS,

BY

CAPTAIN A. K. ABBOTT, B. S. C.

Since writing the first portion of this paper, I have had the good fortune to procure a copy of "Travels and Adventures in Assam," by Major John Butler, and also to refer to reports by his gallant son, the late Captain John Butler, who was killed in an encounter with Pangti Nagas in 1876. I, however, have been unsuccessful in procuring "Robinson's Assam," published many years ago—I think 1842. When first ordered to Assam, I overhauled all the principal bookseller's shops in Calcutta for some work on the country in which I was about to soldier, and remember an old volume of "Robinson's" work being offered to me for one rupee, which I at the time discarded, but now would give a great deal more for the same. Major Butler's book, which was published in 1854, is of course now out of print. And as the author was intimately acquainted with the Nagas, his book is most interesting to those who have served, or are at present serving, in the Naga Hills. Also, as the author in his preface states:—

"As the Indian Government has been pleased to allow the author "to derive his information from official correspondence, its authenticity may be relied on, and he entertains a hope that his labours will not "be deemed uninteresting or valueless," so, the book may be regarded as public property, and from which I will not hesitate to make extracts and quote freely, as from personal acquaintance and enquiries, I find the people are little, if at all, changed, except in the power of doing mischief and giving trouble by the introduction of fire arms, as must be expected of all savage independent tribes, who come in contact with civilization, through trading and marauding expeditions.

To give an idea of the difficulties to be surmounted, and the hardships to be borne and endured in travelling in these rough hills, where range after range of steep mountains succeed each other as far as the eye can see, without any break, I will give an extract from a letter from the late Lieut. W. Holcombe, Assistant Commissioner, dated Moklom (on the Patkai) Naga Hills, April 13th, 1874.

"We are having rather a bad time of it; occasionally nothing but "rice and goat, and a minimum of both to live on. Your men (42nd) "say, if on the Looshai expedition they had half the "dukh" they are "now having, the whole army would have died!

"The "damdoms," an insect about the size of 10 musquitoes, are "what Samuells (late Survey Department who died in Khyber Pass) calls simply "dam-dom-(able)." I have seven sepoy pretty well "laid up with swollen legs from the bites of these beauties, and not fit to "march; if we meet active opposition at all, we shall do so during the "next 10 days, for we shall be far away in the heart of the Arbor "(Naga) country, in the region of big villages, south of the country "from which Brodie had to retire in January 1843 with a detachment "of your men, having got rather the worst of it. The difficulty lies in "explaining that we have not come to fight." This brave and most promising Political Officer, who lost his life shortly afterwards, under circumstances which will be recorded, was most sanguine in his ideas of treating with savages, viz: confidence and kindness, which he unfortunately carried too far, and which resulted in the loss of his own life as well as that of a number of people belonging to his camp. Savages are, generally speaking, most treacherous; to them the slaughter of victims lured into a trap under cover of friendship, is looked upon as a great strategical movement, the perpetrators being eulogized and regarded as heroes by their fellow villagers. Captain J. Butler, who enquired into and reported on the circumstances of this lamentable slaughter, observes:—"Then as for the real reason of the massacre? The question "is, in my opinion, very simply answered in one word—"opportunity." "Had no opportunity been given, no massacre would have occurred, "notwithstanding any number of messages or any number of plots. "For, as I have repeatedly said before, as an open and declared foe, the "Naga, as a rule, has such a dread of fire arms, that he is simply "contemptible before any force thus armed, whatever else he may be "when fighting against his brother Naga: indeed the very story "of Captain Badgley's able retreat, with a mere handful of men, "who must have been more or less demoralised by what they had "undergone, hampered with wounded and laden with ammunition, "most clearly proves this to be the case, and it is most curious that "the "sulky" demeanour, followed afterwards by more peaceful "overtures of the "Ninu" men, noticed by Captain Badgley (and referred "to in his first report) is, if you remember, very similar to the demeanour and conduct of the "Wokha" men towards me (as reported in my "letter dated 7th January last), and I feel convinced now that had "I allowed those men (of Wokha) to come into camp then with their arms "in their hands as they wanted to, we too should, in all probability, have "met as sad a fate as those who fell at "Ninu." Then again, if it be asked, why should they seek for an opportunity? I would reply:—long "use has made it second nature to the Naga to seek for human heads "which he simply looks upon as the noblest trophies of the chase with "which either to decorate his ancestral halls or adorn the walls of his "Assembly Rooms (Dekha Changs or Morangs), according to the "custom of the tribe to which he belongs, and in like manner "as the civilized man considers it only fair and right to kill or "capture the wild beasts of the field by any or every stratagem, "so in like way, the savage considers he may circumvent and

"capture or kill, not only the wild beast, but his fellow man as well, "by any and every kind of means that lies in his power. What we term "foul treachery," he looks upon as "skilful strategy," and notwithstanding what we occasionally hear about the "truthful savage and his good faith," my own experience has been that, with few exceptions, "savages scarcely ever in their natural state know the meaning of these terms, as we understand them, although I must do them the justice to say they can easily be taught their significance, and learn "thoroughly to appreciate and admire the virtues which they, even then, find it difficult to practise. I must beg it to be clearly understood here that I am not stating these facts with any view to the utter condemnation of the savages—far from it—for I have often known and proved him to possess many most noble and endearing qualities, and any how, I consider the highland savage of Assam, with all his faults, is a far more manly loveable being than most of his lowland neighbours." This is the testimony of an officer who had been acquainted for some years with the Naga hill tribes, and fully appreciated the position in which he was placed, and most conscientiously discharged the important duties of his post both with reference to the savage and the Government he had the honour to serve. I remember his observing to me, during the Ninu expedition, that the Anghami Nagas would, before long, give the Government a deal of trouble, which has been the case to an extent even exceeding his anticipations.

All nationalities and classes or races of men will fight for their independence; at the same time, so long as they are certain of the intentions of their visitors, whether peaceable or otherwise, so they receive them with hospitality and friendship or else resort to treachery to get rid of the danger of annexation and spoliation, with which the presence of the surveyor with his theodolite, are generally associated. These Anghami Nagas are a fine intelligent race, and have a very good and rational idea of right and wrong, of power and might, of resistance and forbearance; brave deeds done by warriors are handed down from generation to generation for the example and guidance of their children as is the custom with civilised nations of Europe.

Also, from their active and wild life, their muscles fully developed, and energy at the maximum, they have imbibed the leading attributes of the British pugilist, as laid down in *Fistiana*, viz, "what I cannot do, no other man can do," and (*palmarum qui meruit ferat*) "let him who deserves it, bear the palm." The Maori of New Zealand is very similar, only more formidable when on the war path. I have visited their Pahi, or villages, to barter cattle, lived with them for days, and always found them most hospitable and friendly, but as an enemy they proved themselves very formidable indeed.

I will now give Captain Badgley's account of the Ninu massacre—which was published in the public newspapers shortly after the occurrence:—in a letter addressed to Lieutenant Colonel H. S. Thuillier, Surveyor General of India.

"I have the honor to inform you that on the 1st February 1875, we arrived at Ninu, an Abor village four marches from the plains. I was detained as usual by survey work on the road, and did not pass through the village until sometime after Lieutenant Holcombe and the rest of the camp. The people seemed sulky, Lieutenant Holcombe said they were frightened, and did not come out of their houses at all as he passed through. In the evening some of the headmen brought a small present of rice, fowls and roots. They were told not to be afraid to bring more in the morning, and that the whole village was to come and see us. About sunrise next morning there were a number of Nagas in camp. Sitting in my tent, I heard one of the headmen say to Lieutenant Holcombe, "The Raja (village headman) is there, but is afraid of the gun." Lieutenant Holcombe took the rifle from the sentry, and gave it to the Naga, who then began to laugh and dance with the rifle on his left shoulder, while he flashed his "dhao" in his right hand. Lieutenant Holcombe then turned, apparently to draw the sentry's bayonet, when one of the young men felled him with a blow from behind on the side of the head, and there was a yell raised all through the camp. I sprang up to draw my pistol, hanging to the back pole of my tent, as several of them rushed in, I fired into them, and made my way out behind (my tent provisionally being made to open at both ends), and was followed by two of them, whose blows I avoided as well as I could, firing meanwhile, when, at the moment I fired the fourth shot, I tripped over a stump and fell."

2. "When I got to my feet again, the Nagas had disappeared, and a wail was rising from the camp instead of the cries and shouts of a moment before. Running to where Lieutenant Holcombe lay, I found him with two crossed cuts on the right side of the head, exposing the brain, the sentry near him with his head hanging by a strip of skin. I ran to the sepoy's lines, where I found a few men firing at the retreating Nagas, and getting a rifle, did what I could. I did not know until it was all over that I had not escaped scot-free, so little do sharp cuts pain at first; but I found that I had a cut on each arm and on each leg, the worst on the inside of the right thigh, which I expect will keep me quiet for some time to come. My escape I can only suppose to have been through having killed the leading man attacking me with my last shot, when his second, seeing me fall and thinking I was done for, carried him off according to Naga custom.

"3. I encouraged the men; the camp was searched for wounded, arms and ammunition. Each person was told to take a little rice with him. The unwounded carriers were told off to carry the wounded and such things as it was important to save, and I called on the men to advance with me on the village. But they had been too much shaken and refused, and entreated me to lead them in an opposite direction. As whatever was to be done must be done quickly, I was obliged, which I shall always regret, to give over reasoning with them,

“and to chose to retire (though now, on consideration, I think that that was the wisest course). We seemed a mere handful overladen with spare ammunition and encumbered with wounded and coolies, and the arguments agaist attacking the place, that more than half the guns had been taken, that we were nearly all wounded, and that the village would have been specially prepared for defence, were not to be answered. There was a spur to the west leading down to the Disang above where we crossed it on our march from “Sanua” to Ninu, which was, for the most part, cleared for cultivation, and I saw my way to getting by a pretty open route up to and past “Sanua.”

“4. The Nagas followed and surrounded us, but we killed some, and drove them off, and dispersed a last party who were making a rush at us when we reached the wide bed of the Disang, after which we saw no more of them, which, I think, proves my suspicion that an ambush was prepared for us on the direct path to be correct.

“5. The march along the winding and stony river was most slow and toilsome, and we did not get to the Sanua spur till night fall. Two of the wounded had died on the way. We cut our path up for some way through the jungle to where the spur was clear, and after following the cultivation path as far up as was safe, turned to the left to pass under the village. All this took much time, the jungle was thick, and the side of the hill very steep and of loose slippery shale; and when the morning star rose, I saw that it was impossible to pass unobserved, so I gave the party an hour's sleep.

“6. At dawn we took up a good position near the village, and were soon seen from all sides. The “Sanua” men swarmed down, but I warned them through a Naga with me not to come near and they gave way as we went on. They tried to persuade me to pass through the village, even going through the pantomime of executing their head-man to induce me to do so. Passing round the village, we found at our old camp a Khalassie and three coolies of the survey who had brought up the post. Here I had intended to have halted and waited for relief, sending off the wounded; but fortunately, one of the three coolies was strong enough to carry me (which was indeed most fortunate, as my wounds had become stiff and painful, and had given me fever and a swelling in the groin, so that I could not have walked further); so after resting from 8 to 2, we marched and encamped near Bor Bang Sang. On the 4th we passed through Bor Bang Sang and Bormuthun (where we got food for the first time); continuing through the night, we reached Borswali on the afternoon of the 5th, and arrived at Jeypoor next day. Here the wounded were attended to by Dr. McKay of the 44th, Dibrughar. One of my Khalassies died on the night of the 6th, a sepoy on the 4th, and several other sepoys, carriers and a servant, are, I am grieved to say, beyond recovery.

"The following is a list of the party as it went in, and as it is now :—

	1st February.		7th February.	
	Number.	Killed.	Wounded.	Unwounded.
Officers	2	1	1	...
Jemadar, 44th	1	1	...	...
Havildars	2	1	...	1
Naicks	2	...	2	...
Buglers	1	1	...	...
Sepoys	36	7	9	20
Havildar, Police	1	1	...	...
Sepoys, do.	11	7	...	4
Hospital Assistants	1	1	...	...
Baboo	1	...	1	...
Weighman	1	...	...	1
Survey Khalassies	8	4	2	2
Khasia Coolies	79	37	25	17
Ghoorka do.	26	4	3	19
Naga do.	16	12	2	2
Duasia do.	4	2	2	...
Servants	5	1	4	...
TOTAL... ..	147	80	51	66
				117

The foregoing thrilling narrative will demonstrate how necessary it is that the first principles and directions for guards and escorts, as laid down in the drill books and regulations, should under no circumstances be violated or deviated from. As will be observed, the Nagas, under pretence of fear, succeeded in persuading Lieutenant Holcombe to disarm the only man with a rifle in his hands, viz., the sentry over his tent, and the rest of the men, being engaged in packing up their bedding, were ruthlessly slaughtered; the Nagas having previously distributed themselves throughout the camp, and only awaited the signal of disarming the sentry, to strike right and left amongst the unsuspecting coolies and sepoy. Some of the Goorkha coolies, who almost invariably carry the kookry, fought it out, and were more than a match for the cowardly enemy—but several were cut down before they could draw their blades.

Fortunately, at the time of this occurrence, a force was working in the Dufia Hills under General Stafford, C. B., and as their work was, to all intents and purposes accomplished, a portion was at once ordered to retaliate on these Nagas for the massacre of Holcombe's party—and very effectively it was done. An equal number of the 42nd and 44th Regiments were dispatched with a cooly corps, under the command of Colonel J. M. Nuttall, C. B., Captain J. Butler being Political officer, and Major Heathcote, Quarter Master General. More energetic or go-ahead Political and Quarter Master General could not be desired for the special service in these hills, where strong legs and good wind are required more than equestrian accomplishments—for ponies even could not go over the ground. Well, this expedition was most successful, sepoys and all concerned worked with a will, rivers were bridged, roads repaired, and rations pushed on. No time could be spared, as the rains were on us, terrific thunderstorms soon became the order of the day, and almost daily rain, causing, of course, great inconvenience to the transport, and every body else, as we had no tents, and had to make the best of it, with waterproof sheets and skill in arranging the same, to obviate the least possible inconvenience from the hostility of the elements, which really, in our recent war operations, have caused considerably more loss than the powder and bullets of the enemy.

The results of the campaign to avenge the massacre of Lieutenant Holcombe's party, are thus narrated by Captain Butler, the Political officer, in his report:—"To sum up results then, I may briefly say, "we first of all clearly ascertained and thoroughly satisfied ourselves that "seven villages had really taken an active part in the massacre we had "come to avenge; and then, that important question being decided, "every one of these seven villages was attacked in turn, burnt to the "ground, and all their household property destroyed. And here I must "explain that the Naga's house is not that worthless, ephemeral thing, "some would have us believe it to be, but on the contrary a solid structure, "to be only erected with much time and labour; a fact that can easily be "understood, when I give the actual dimensions of one of them which "was measured with a tape, and found to be 200 feet in length, and "42 feet in breadth. Nor is the furniture in it so utterly valueless and "easily replaced as some imagine, for, to say nothing of the huge rice "pounders, hewed out of solid trees, with which each house is invariably "furnished, there are the seats, large planks for sleeping on, and numerous "wooden platters to eat off, &c., all cut and carved out of solid wood, and "one has only to try to purchase some of these articles to find out how "much they are valued. Then besides all this, they lost several hundred head of cattle, mostly magnificent mithun, pigs, fowls, goats, and "a very large quantity of rice and other grain, and finally numbers killed "and wounded, regarding which I have purposely heretofore refrained "from making any statement, as in all jungle warfare, where the enemy "are in the habit of carrying off their killed and wounded, it is one of "the most difficult things to estimate."

Having lost my own notes, together with other property during the late expedition of 1879-80, I must give Lieutenant (now Brevet

Lieut.-Colonel Woodthorpe's observations on the tribes visited during the expedition; the report is marked Appendix X, dated Shillong, April 29th 1875, to Captain Butler's report on the operations: the sketches alluded to I, of course, cannot give.

"I have the honour to forward a few notes on the tribes visited "by the late expedition to the Naga Hills. The area of the country "passed through being limited, and our opportunities for observing the "natives of the villages which our troops were sent to punish, being few, "I can only describe, with any minuteness, the men of the Mutan, "Bor Bansang and Senua villages, premising, however, that the men of "Ninu, Nisa, judging from what we were able to note, do not seem to "differ materially from them and that they are all probably members "of the same tribe. We were accompanied by a small detachment of "Borduaries and Namsangias, of whose personal appearance and "decorations I am, therefore, able to say something, although I had no "opportunity of seeing their villages or country except from afar.

2. "The men are of average height, and nearly all well made and "well developed, and, as is the case in most hill tribes, their complexion "comprises every shade of brown. They would be good looking as a "rule, very often, but for the tattooing on their faces, which, in some, "makes it appear perfectly black, where the tattooing has been heavily "done; in others the tattooing is blue, and then the bare portions of the "face, especially in those of fair complexion, appear pink by contrast.

"The tattooing in the face, called in Naga "A K." consists "of four continuous lines carried across the forehead round and under- "neath the eyes up to the nose, back over the cheeks, and round over "the corners of the mouth to the chin. Rows of spots follow the "outside lines and two fine lines mark out the nose in a large space. "The Mutans and Senua men do not tattoo much on the body, but "their thighs are tattooed in several places, with lines and spots, or "diamond and egg-shaped patterns, the upper portion of the "tattoo being continued round to the back. The Namsangias, "and the Borduarias, do not tattoo the face at all, but their "shoulders, wrists and thighs, are very much covered. The "men of Voka, Khanu, &c., in addition to the tattooing of the "Senua men, frequently cover their chests with fine lines, either hori- "zontal or zigzagged. All the men dress their hair apparently in the "same fashion, *i. e.*, shaving that just above the ears, and taking the "remainder back off the forehead and face, and tying it in a knot "behind, through which are passed curved strips of horn, carrying waves "of red and white or black hair. Some of the men have a small "moustache but very few show any thing like a beard.

"The dress and decorations of all the men we saw were essentially "the same, the only difference perceptible being in the style of or- "namentation, differences due to the various tastes of individuals, rather "than to any attempt at distinction of clan or village. The helmet is "conical in shape, and made of plaited cane, either plain or having "patterns of coloured stars worked over it. A large plume of black or "red hair passes over the helmet from front to rear, and long horns,

“carrying Toucan’s feathers or tufts of hair, spring from the sides. Some helmets are covered with leopard or bear skin, and have a wreath of red or black hair round the base. Another head dress is a circular band of colored cane and straw, ornamented with bits of a large shell and a fringe of hog’s hair, which lies on the forehead. Their ear ornaments are generally strings of beads pendent from a piece of shell and terminating in long tufts of hair which fall over the chest. They have a very pretty one made of alternate tufts of red, white and black hair, radiating from a centre of yellow straw work which is fixed in the lobe of the ear. The necklaces are beads, some of which, of a yellow opaque colour, are highly valued by the Nagas. From the shoulders to the elbows the men encase their arms in many rings of red and yellow cane, very large at the shoulders, gradually decreasing to the elbow, these give an appearance of great breadth to their shoulders, an effect which is further heightened by the bands of yellow or black cane which are drawn very tightly round the waist, and this effect is still more increased by the lines drawn by the Borduaries from their breasts to their navels. One man had as many as nineteen turns round his waist, giving a total length of cane of over 40 feet. It is amusing to see them winding this cane round them, and it is a matter of time to get it all properly twisted on. Large belts, very broad at the back, fastening in front, and made of plates of polished brass or coloured cane and cowries, are also worn. A broad piece of blue cloth hangs from the waist, ornamented with red fringes and rows of white beads; a portion of the cloth is taken up between the thighs and secured at the back as an extra piece of decency by those who visit the plains. On the wrists are worn deep bracelets of cowries, and below the knee strings of the same are also tightly tied. These Nagas are very skilful in devising little ornaments from palm leaves, making coronets, wrist bands and anklets of them. These have a most picturesque appearance. A curious custom prevails at Voka, and I fancy also in the neighbouring villages; it is this—till a young man is married he goes entirely naked, and he at once adopts a waist cloth when he takes a wife to himself. Every Naga carries about with him a small basket or bag for his food, pan, &c. In wet weather he wears a cloak made of grass on a small string foundation. The large cloths worn in the cold weather are generally Assamese silk. * *

“The women are short in stature generally, and their figures are remarkable rather for strength than beauty, to which very few have any pretension. They tattoo a good deal on the shoulders, body and legs, but not on the face. The shoulders are tattooed with diamond patterns, three horizontal lines are taken across the body, above the breasts, between which right lines go down to the waist, narrowing gradually to a point. The navel is the centre of a Maltese Cross, each arm being about 5 inches long, consists of 3 lines with a pointed finial. The leg tattoo is done with an admirable sense of fitness, that on the thighs consisting of close vertical lines, and on the calves of horizontal lines, a small break occurring in each on the shin

"bone. This has the effect of increasing the apparent rotundity of the legs between the knees. The women wear their hair braided and tied in a knot at the back, or else gathered up and tied into a small bamboo tube covered with parti-coloured cloth or beads, the lower end decorated with a red fringe or a long tuft of hair. The dress of the women consists principally of a very small petticoat 2 feet 2 inches long and 6 inches deep, ornamented occasionally with bells, beads and shells. This only comes a little more than half way round the body, leaving the right thigh bare; it is attached at the ends and middle to a string passing round the waist. Sometimes a small cloth is worn round the shoulders; many strings of beads fall low down over the breasts; small fillets of coloured straw adorn their brows, and several massive white metal rings are worn above the elbow. Their ear ornaments are principally small strings of beads passed through various holes in the ear.

"The arms of this tribe are the dhao, spear and cross-bow. The first is a most formidable weapon—the blade is generally triangular, about 18 inches long, straight at the back, and 4 inches wide at the top, narrowing gradually with a slightly convex edge towards the handle, which is 2 feet long, and ornamented with tufts of coloured hair. Sometimes, instead of being straight all the way up, the back of the blade swells out towards the top in a semi-circular projection. The spears are not by any means such handsome or formidable weapons as those used further west, and this is due, I fancy, to the fact that, with the eastern tribes, the dhao, and not the spear, is the principal weapon of offence. The spear head is small, * * the shaft, though short and slender, is strongly made of bamboo, and decorated with red and black hair in various fashions. The "cross-bow" is exactly similar to that described by me last year * * *. The "shield" is small, about 4 feet long by 2 feet wide, and made of buffalo hide, decorated along the upper edge with a fringe of red hair, and on the face with two or four tassels of grass.

"Every man carries with him on the war-path a large supply of panjies, which he plants in the road to cover his retreat. These are carried in a horn suspended at the back, or in a small basket to which is attached a long tail of bear skin. Sometimes this panjie holder is the skin of a bear's foot, with the claws remaining, the skin being sewn up to form a large bag, a little figure of a sitting man, dressed and painted after life, being affixed to the upper part. Some men wear a kind of defensive armour in the way of a leathern corset, which overlaps on the chest, and is kept up by means of straps which pass over the shoulders. The Wokha men also wear a leather corset but without shoulder straps.

"We found amongst these men a large number of gongs, which they probably get indirectly from Burmah. They cast little bells themselves very well in little clay moulds, the material being apparently a kind of gun-metal, and occasionally brass. I have also shewn in figure 6 a woman's walking-staff, a long thin iron rod foliated at its upper end.

Country.—"The country we passed through was fine and open, except for the first march from "Boruachali," in the plains, to Kulan-Mutan, the path lying through a dense forest and following the course of a sluggish stream with muddy bottom; but, on reaching Bormutan, the first extensive view of the country is obtained. It is well watered by several large tributaries of the Dilli or Desang river, as it is called in the plains, and Tisa as it is called by the Nagas themselves, meaning the "large stream."—"Ti" being the prefix for all river names, and "Sa" an affix signifying large. It was the largest stream we had to cross, * * * water was abundant along our route, especially beyond Ninu, where the undulating park-like character of the slopes, backed up by tall, dark wooded cliffs, suggested itself as an admirable site for a station. Mithun grazed about the grassy slopes in large numbers, and herds of hill buffalos were seen at several villages. Deer were seen here and there, and about Nisa partridges flew up from the grass on either side of the path, at every turn. Tree ferns, sago, and "Takopat" palms are seen near most of the villages and in the deep ravines—the latter are most carefully preserved, as they are most valuable for thatching purposes.

Villages.—The villages are not always well placed for defence against rifles, being commanded from some neighbouring heights, but others, such as Borbangsang, Senua, Niao, &c., are exceedingly well placed, occupying the highest points of the ridges on which they stand, and commanding all the approaches to them. The defences consist of double stockades made of interlaced bamboo and cane, and panjied ditches. The houses are generally scattered up and down without any attempt at order, and are half hidden among the trees, which are not, as elsewhere, cut down to clear a village site, such only being felled as interfere with the houses; these are built on unlevelled ground, the floor being carried out to the rear on bamboo piles, the back verandah being frequently a great height above the ground. The houses are divided into an entrance hall, as it were, where the owners weapons hang, also skulls of animals taken in the chase, and beyond, into several small apartments terminating with a large open verandah. Trays are suspended over the fire-places (of which there is generally one in each apartment), on which flesh, fish, vegetables and wood are dried. The walls of the house are of bamboo matting, the roof being thatched with palm leaves or grass. The principal uprights project through the ridge some 2 or 3 feet, this portion being thatched also, to keep the rain from running down the post into the house. This thatching is ingeniously worked into figures of men or animals. The reason given for this projection of the posts is that, as the part below the ground decays, it can be cut off and the post lowered without damage to the house. The Vangam's, i. e. the headman's house, is always very large and built on the most level site in the village; it is generally 200 feet long by 40 or 50 feet broad, and contains two large halls, one at either end, the intervening space being divided into several apartments and store rooms, arranged on either side of a central passage. Each of the women's apartments

"has its own door of exit and verandah. At one side of the entrance hall stands the drum—a large tree hollowed out and carved roughly at either end. It is played upon with clubs shaped like dumbbells; a large number of men perform at once on the drum, and tho' each seems to hammer away entirely on his own account, the effect is harmonious and pleasing * * *. Opposite the drum is the rice pound—er, of great length, giving occupation to nine operators. The other hall is kept as an audience hall where the chief receives his friends; it has a raised and matted floor, the rest of the building having, as a floor, the bare ground. This hall opens into a verandah. Every house is furnished with a few small stools with four short legs, and one or two large beds, which, with their legs and a slight attempt at a bolster, are each cut out of one log. Tables made of cane work, shaped like an inverted wineglass and about $2\frac{1}{2}$ feet high, are used, on which to place their food at meal-time. The principal posts in the Vangam's house and the "Morang" are generally rudely carved with representations of men and animals. In each village are one or two Morangs, or bachelors houses, in which a drum is kept, and also the collection of heads taken in battle; these are placed in rows of about 25 each on a large sloping tray placed in the verandah, just within the shelter of the roof. At Bormutan there were 210 bleached (human) skulls arranged in this way.

"These villages are remarkable for their sanitary arrangements; small raised houses in which calls of nature are obeyed being built in various parts of the village and fenced round. Look-outs are built at all the gateways and in front of the Morangs, and here watches are always kept; these are also erected in the fields. At Kamhua I saw some watch-houses in the fields surrounded by a double stockade, enclosing a passage all round, and over the outer gateway a small platform was erected. Between Senua and Niao, by the road side, was a small table raised about 8 feet from the ground, approached from either side by a broad wooden ramp. We were told that here peace was concluded between these villages after war, the chiefs walking up, each from his own side, meet face to face on opposite sides of the table, and exchanging "Chungas" of wine, drink to each other, and thus declare that peace is made. On the road to Niao also was a curious mud figure of a man in bas-relief presenting a gong in the direction of Senua, this was supposed to shew that the "Niao" men were willing to come to terms, if possible, with their enemies. Another mode of evincing a desire to turn away the wrath of an approaching foe, and induce him to negotiations, is to tie up in his path a couple of goats, sometimes also a gong, with the symbolical palm-leaf, planted in the ground hard by.

Tombs. "The mode of disposing of the dead is the same in all these villages in its main point, viz: wrapping up the corpses in cloths and mats and placing them on platforms under small roofs. The shape of these roofs differs in different villages slightly, but all are decorated with various coloured cloths and streamers, and have at each end a tall figure of wood, dressed, painted and tattooed after the

"manner of the men of the village, and carrying imitation spears, dhaos and shields; gourds, baskets, &c., are suspended about the tomb. At Khanu the tombs were enclosed in sheds with doors, each shed contained several tombs of adults and children, being in fact regular family vaults. These tombs are all arranged on either side of the principal entrance to the village. Cairns of stones are also erected where the heads of departed villagers, decorated with shells, beads and bells, are collected, and earthen ghurras, filled with the smaller bones, are ranged amongst them. Each head is decorated in a slightly different way from the others, in order that they may be recognized by their surviving relatives." * * *

The foregoing report by Lieut. Woodthorpe gives a good idea of the Naga hill tribes amongst whom we campaigned at that period; they differ considerably in language and various rites, burial of the dead, &c. from the Anghami Nagas. I have unfortunately lost my note book of this campaign, along with a lot of other useful note books and sketches during the late campaign in the Angami and Kacha Naga Hills.

As I have submitted a plan of the Augami Naga village, Sephama, it may be interesting here to make a few remarks on the same, as it is a village that has, from time to time, given much trouble and held an important position amongst the villages in its neighbourhood, for, as far as back as 1840, it is described as "an old village of 300 or 400 houses; and at this period the inhabitants oppressed and plundered all the small neighbouring villages." In 1840, Mr. Grange, Sub-Assistant to the Commissioner, "set out on the 18th February to accomplish a meeting with some lawless Anghami Nagas further eastward. The first day he encamped at Mejiphima and the next at Piphima, where a cooly going for water was wounded by the Nagas. Leaving Piphima on the 20th, before passing through a track of grass jungle, Mr. Grange took the precaution to halt and burn the jungle, and clear the paths of panjies. In the interval, four Nagas made their appearance in the rear, evidently to set fire to the grass previous to an attack in front. Instead of returning or meeting the party in a friendly manner, they assumed their usual war attitude of defiance, and commenced jumping about and spinning their spears. This conduct immediately brought the fire of the sepoys upon them, when one Naga was killed, and another, though severely wounded, effected his escape by rolling down a precipice. The path being strewn with panjies, these had to be removed before the party could advance and form their fenced camp about 4 miles in advance of Piphima, on the banks of a small stream. In the evening, beacons or lights as signals, were observed on the high hills, the number of lights at each station, signifying that the party was advancing, halting or retiring.

"The progress of the party on the 21st was very slow, in consequence of the number of panjies required to be removed from the path, and although the distance was only 5 miles, the encamping ground at Sephama was not reached till 3 P.M. The Nagas deferred their attack on the party till within a mile of the village, at a rocky part of the hill, when five or six men sprang out on the leading files and

"threw their spears, and before the sepoys had time to fire they rushed down the precipice. Several men of the guard were struck with spears; but their clothes being tied on loosely they escaped uninjured. The enemy had erected an embankment which they deserted, on a flank movement being made to attack. The village was carried without much opposition, although the entrance was very strong. The passage was through a narrow lane with a stone wall on each side, and a single plank of considerable thickness formed the door."

The party now had considerable difficulty in finding water, which was contained in a well some distance from the village, but was found to be poisoned by a root found in the neighbouring jungles. "When the whole party had partaken of the water, they experienced very unpleasant effects, being afflicted with a dizziness and heaviness of the upper eyelids which made it difficult to keep them open."

The party, having stockaded themselves, remained here for six days, and were employed hunting up the Nagas and destroying their grain. After which they returned to Samguting on 27th February 1840.

During the late military expedition under Brigadier-General Nation this village again came in for its share of punishment. Its head man is called Saloji, who having been in the service of the police, had of course been trained to the use of fire-arms and had not kept the knowledge to himself, but had been actively engaged, along with several other ex-sepoys and police, teaching the village braves how to take aim, and the different positions for firing as laid down in the musketry regulations. The Brigadier-General in his dispatches thus notices this affair. "I moved my head quarters on the 15th November to Suchema, leaving Major Evans at Pephima with his detachment of the 43rd N. I. with orders to burn the village of Sephima distant some 12 miles. Saloji, the chief of this village, had in former years been friendly to the British Government; but on this occasion he had not supplied coolies when ordered to do so, and had been reported by the Chief Political Officer as an offender in other respects. Major Evans carried out this order on the 16th November, meeting with considerable opposition. His casualties were, Lieutenant Maxwell, Assistant Political Officer, wounded in two places; 2 sepoys severely wounded (both since dead), and one slightly wounded."

But this amount of sport was not sufficient for Saloji who now took to amusing himself firing at passing convoys, especially at places where the political path, as it is termed, crosses streams, where there is almost invariably some kind of clearance, and the men being thirsty at once flounder into the water to drink. Also at Pephima, unfortunate coolies, and sometimes sepoy sentries, were fired at, so when I came up to that post, I was ordered to take the men with me and re-visit Sephima as the Nagas had apparently re-occupied the village and could be easily seen in large numbers with our glasses. The movement was kept quite secret, and I had taken the precaution to put the Naga, who was to be my guide, in charge of the Quarter Guard, and marched at dawn on the 24th December; several loopholed stone defences were passed, and the Nagas did not observe us until close to the village, when they opened

fire, and, as we entered the village through the only two openings (one of which was partially filled up) the Nagas retired; but all round and close up to the walls was dense tree jungle, of which they took full advantage and kept up a constant desultory firing, which obliged me to secure my position at once, as we could see nothing outside the walls. We had great difficulty in finding water, in searching for which much skirmishing took place. The Nagas kept firing until about 11 P.M. when finding that no damage was done, and very few shots fired by my men, they gave a series of loud yells making the tree forest all round reverberate, then, with a couple of parting shots, they adjourned for the night. Early next morning 50 men were dispatched into the jungle around; they had much skirmishing with the Nagas, who finally broke cover, and were seen running up spurs of hills at some distance; a quantity of their grain and other property was found and destroyed, and we returned to camp at Piphima unmolested. The plan I have submitted gives a good idea of the place as I found it.

I will also now refer briefly to the Eastern Angami Naga country, of which I have furnished a plan, as also one of the village "Cheswejuma." The force, of about 200 men and one mountain gun, was placed under command of Lieutenant Colonel D. Robertson. After the usual amount of shouting at the village of Kohima, which was to supply the coolies, guns and rockets placed in position to commence a bombardment of the village, and other stern pageantry of war having been gone through, we managed to get clear away about 11 A.M., and as the road was very difficult, with numerous very steep ascents and descents, over which the gun was carried slowly, we finally encamped on the left bank of the Zullo river about 2 P.M., in some dhan khets, or arrahs as they are termed in these parts, having covered a distance of but seven miles. The night was bitterly cold, and on the morning of the 2nd January everything was found frozen hard, hoar frost lying thick on the ground, and on all the bushes and trees; so after thawing ourselves and property, we started about 9.15 A.M. Crossed the Sijju river about 11.15 A.M. and then commenced the ascent of the long steep spur to the village Thenejuma which we reached about 3.30 P.M. distance 12 miles. Previously to leaving Kohima the Politicals had artfully given out that the village of "Kaduma" was to be the object of attack, whilst "Cheswejuma" was the real one; however it is very difficult indeed to deceive savages of any clime, much less Nagas, who dog your movements like the very best of pointers; for towards evening and throughout the night the good folk of "Cheswejuma" were seen busily employed removing their grain and household property into the jungles; torches were flitting about in every direction, making the scene most animated. On the morning of the 3rd we advanced towards "Cheswejuma," the road skirting along the west side of the spur; to our right was the steep valley of the Taur river, the hill sides terraced right up to the top, forming beautiful contouring lines. The villagers of Khalabagwe and Khalabusa descried us and shouted out as we progressed, for the information of their "Cheswejuma" friends, so when we arrived at the village the lower end was entirely empty, but on approaching the upper village,

at the end of which was a conical mound with a stone wall, a few shots were fired and the Nagas bolted.

All was dead silence, there being dense jungle on each side and close up to the position, so a few shells and rockets were discharged at random into the jungle, to try and unearth the people, but to no purpose. Having rested the men and it being time to return, the village was set fire to systematically, commencing at the upper end; now came the Nagas turn to do a little firing, and what with smoke and strong wind blowing and houses blazing, they came close up and fired at us from the jungle until we had finished the work of destruction and commenced to move all together towards the camp—their firing, however, was bad; although shots were taken chiefly at the Europeans, only one sepoy was grazed in his face and another had his cartridges and pouch shot clean through by an Enfield bullet. We got back to camp all right about 4 P.M. distant about $3\frac{1}{2}$ miles. With our glasses we could see that the threat of destroying Kaduma had had a beneficial effect, for the inhabitants had been to the labour of unroofing their houses, and carrying off their property into the jungle, and what with the echos of the valley of the Taur having been awakened by the boom of the gun, rattle of musketry, and rush and roaring of rockets, the head men presented themselves and humbly tendered their submission, which saved us another long trudge. On the 4th the force halted at Thenejuma and scouting parties were sent back to revisit site of the village we had destroyed on day previous. On the 5th we marched at 8 A.M. towards Kekrima; the path is an easy descent for about 5 miles to the river Mehirr, when there is a very steep ascent for about $\frac{3}{4}$ mile, after that the road runs in easy waves till the top of the spur on which Kekrima is situated is reached, where there is table land and the village about $1\frac{1}{2}$ mile further on. The villagers of Kekrima, which is the village of warriors amongst the eastern Angamis, as was Konoma amongst the western Angamis, received us well, cleared the jungle and helped to hut the men. This village requires notice, as although they did not oppose us, yet when Konoma was captured on the 11th December 1852, and one would have thought that they would have been imbued with the most wholesome dread of our fire-arms, yet “on the 5th February 1853, two heralds came into camp from “Kekrima,” bearing a challenge from the people to come and prove who had the greatest power “in these hills, they or our Government; the Manipuris they said, under Ghumber Singh, were afraid to fight them, and we “seemed afraid also. After seeing our muskets and guns, they scornfully declared they did not care for our (choongas) tubes: meaning “muskets. “Your sepoys are flesh and blood as well as we, and we will “fight with shield and spear and see who are the best men; here is a “specimen of our weapons,” handing over a handsome spear. Their “village was said to contain 1000 houses, and they were dreaded by all “around as a bloodthirsty people who think nothing of murder for the “sake of plunder: they boasted of having in their village a man who “had killed seventy men,” * * *. Captain Reed taking with

him 150 muskets, 2 three-pounders, and a mortar, and about 800 friendly Nagas to fight on his side with spears, advanced towards Kekrima. "On the 9th February they were encamped at the village "Kidima," about 2 miles from Kekrima, and "observed the enemy very busy in making impediments on the path "leading to the village; and so difficult and steep did the approach "appear, that Captain Reed determined not to attack on the southern "slope of the hill, but to ascend the mountain about a mile further "north. On the 10th, therefore, a march was made to the village "Kezomah, about 2 miles distant, and the troops encamped near the "river, which runs at the foot of the Kekrima mountain, where they "halted for the night. This move puzzled the enemy considerably, as "they were uncertain at what part of the mountain the ascent would "be made. The next morning, the 11th February, the troops reached "nearly the top of the mountain without molestation; although an "attack was attempted on the rear-guard * *. The advance guard "being urged on by the friendly Nagas, our allies, got too much in "advance; but having secured a good position on a high piece of ground "commanding the village, their fire was most effective. The enemy "were now hotly engaged with our friendly Nagas, fighting with the "greatest desperation and, in the heat of battle, attempting to cut off "the Nagas heads as they killed them. The sepoys, however, of the "1st and 2nd Assam Light Infantry soon drove them out of the village, "killing and wounding many of them. The guns were fired, which "created the utmost consternation, and the enemy fled in every direc- "tion, utterly discomfited, leaving 100 slain on the field of battle, "including many of their most noted warriors * *. It is currently "reported that there were 300 Nagas killed on this occasion * *. "So determined and hostile were the enemy that several times during "the night they attempted to attack the troops, and it was found "impossible to procure water for the troops during the night, the enemy "lying in ambush in every direction."

The above shews the fine chivalrous spirit which pervades these savages, sending a challenge to single combat to troops flushed with victory after reducing the neighbouring villages to submission. However, we did not expect any trouble, but on the following morning, when a demand for coolies was made, affairs became very different, and the usual remedy of a shell and a few rockets had to be resorted to, when the people turned out and took up the loads, and at about 10 A.M. on 6th January, we proceeded on our journey towards Kidima, an easy march as far as distance is concerned, there being only the long descent to the Sijju river, then a rather abrupt ascent to the village, which we reached about 2 P.M., and formed camp at the north end of the same. The coolies had to be placed under guards, but nevertheless several escaped. On Tuesday the 7th, we marched for Viswema which was reached about 1 P.M., here we found a guard of Manipuris stockaded, and as they are very careless about sanitary arrangements, we went on and camped in some fields about a mile further towards

Jakoma. On the 8th we halted, as the Political Officer had to enforce certain fines on this village for participation in the attack on Kohima. On the 9th we intended to have marched but the Nagas were dilatory in complying with the Political Officer's demands, so the force was moved up and took post close to the village to act if necessary, and kept shivering in the constant drizzling rain for several hours. On Saturday 10th we marched for Kohima about 11 A.M. distant about 14 miles, but over a most dreadful path, made almost impassable at places, being so slippery by the almost constant downpour of rain throughout the day: the rearguard arrived at Kohima at 11, 30 P.M.; the night was pitch dark.

Thus ended the expedition into the eastern Angami Hills. I did not notice any difference between these Nagas and their brethren the western Nagas—they all appeared a fine prosperous race, cultivating a large area of hill side, carefully terraced and irrigated. The language, however, is different.

PART IV.

As we had to visit the villages of Ridima, Nakama and Sabuma en route to Paplongmai, so we were obliged to revisit Lakema, and the road promised to be a most difficult one by all accounts. Major Butler describes it as follows.—“We passed on to a deep valley, from which, by “a zigzag footpath, we were led over one of the most precipitous hills “I have ever crossed. We were obliged to crawl up it on our hands and “knees with naked feet; walking was quite out of the question, for the “path was as slippery as glass and a single false step would have ended “in destruction by a roll down a precipice of many hundred feet.” This, together with the ambuscades which our Naga guides said were prepared for us, made us move with great caution. However, the guides apparently selected a much easier route; instead of dipping straight down into the valley and then up the other side, they took a path skirting along the ridge, and passing not far from Talukima. We reached Lakema about 1-30 P.M. after a not very trying march, being of course through dense jungle, but the undulations were easy. We discovered that the houses we had occupied only a few days previously had been burnt; the Nagas were so delighted at having got off so cheaply that they had a big feast, and during the festivities they managed to set fire to the houses, and a strong wind blowing at the time, made it impossible to save them. We also learnt that the village of Jalukima lost 12 houses a few hours after our departure; no doubt the Nagas put down these acts of incendiarism to some malevolent Dhéo (as they call the invisible power that works for good or evil). We had lately given up occupying Naga houses ourselves, *i. e.* the European portion of the expedition, as

we found them so full of filth, pigs, fowls, and more especially rats, that it was impossible to sleep; so having picked out a clean spot, we ran up shelter with waterproof sheets and tarpaulins, and having procured fresh grass, made ourselves quite comfortable considering the circumstances.

As it was necessary to reach Nakama, if possible, next day, we set out about 8-30 A.M., and proceeded up the spur of the Barail on which Lakema is situated. We had a heavy pull up a sugar loafed peak, then turning northward went along the top of the Barail, the road being difficult and trying. We passed above Ridima over a peak 5887 feet, near Ridima, just below the road on the outskirts of a dense tree forest. A keen-eyed Goorkha discovered a deer grazing which Lieut. Barrett knocked over with one shot, just as the beast had become alarmed and had turned to bolt into the forest, to the admiration of our Naga guides, and considerable excitement amongst the Ghoorka element, several of whom immediately dashed down the hill side to secure the prize, and, of course, the grass being long, many had awkward tumbles.

After this little diversion we plodded on, and finally, after the worst ascent we had hitherto experienced, Nakama was reached at about 6. P.M. The entrance towered about 60 feet above our heads and was attained by three sets of ladders composed of notched logs, placed on the face of a very steep rock. The village was found unoccupied so we made ourselves secure for the night, and tried to induce the Nakama men to come in, but failed. The next day (8th March) a reconnoitring party under Lieut. Barrett was despatched along the road to Paplongmai, taking a few entrenching tools, as it was more than probable that the road had been made impracticable. Another party, with some Kohima Nagas, scouted the jungle in the immediate neighbourhood, and soon we were glad to see bags of dhan being brought in as our Commissariat stores had been reduced to a minimum. It was fortunate that the reconnoitring party had been sent out, as when Lieut. Barrett returned about 4 P.M. he reported that he had found the road, about a mile or so from the village, broken in two places, where it passes along the face of a most precipitous rocky hill side, huge rocks frowning over head. The hill sides were thickly studded with panjis; the gaps cut across the road were each about 18 feet in width.

Two sungas had been erected to command this portion of the road, and over head a large quantity of huge stones and rocks had been collected in a line extending 40 or 50 yards, and ready for hurling down on people passing along the road. Fortunately he had the assistance of some 30 friendly Nagas, who ascended the hill sides, hurled down the stones and rocks, and assisted materially in bridging the gaps; and thus the road was made all right for the advance next day.

As it was quite uncertain what our reception would be on nearing Paplongmai, we burnt all the houses of Nakama not required for sheltering the 50 rifles under a native Officer to be left behind in charge of the sick and other impedimenta, and set out with the remainder of the party for Paplongmai on the morning of the 9th. After passing under Sabuma, the nearest path is up the southern end of

the spur on which the village of Paplongmai is situated, but we determined on turning to the left through the village of Sabuma and then up a long spur at the summit of which the fort or stronghold of the village is situated. When about half way up this spur the villagers met us with fowls, &c., and we occupied the place without opposition. I have since learnt that a party of Konoma men were waiting for us at the other end of the spur on the more direct path, and were considerably bothered by our suddenly altering our course. We now set to work and built a stockade, cleared the jungle and made the place as strong as possible, although it is naturally very strong. The spur runs north and south, with the "Zupvo" or "Typhimi" river to the south and east, and the "Zulla" on the west, which join at the south end and form the "Zupvo," which after flowing in a south westerly direction, as far as Lakhema, turns southward with a sharp bend and joins the Barak river a few miles below Berrima. At this place our journey was virtually at an end, as the Konoma men surrendered the Chakar Forts a few days after, and we marched over the Barail to Konoma on the 14th April.

Nagas every where appear to select for the site of a village a lofty spur running north and south, with a commanding knoll, generally covered with dense jungle and unapproachable except by a path leading through the village. Also, on all sides, close up to the village, they leave and encourage the growth of dense jungle, in which they have several pits dug, for the reception of grain and property in case of the village being threatened, and also large golahs made of wicker-work with waterproof top secreted in patches of the densest jungle; these golahs are capable of holding 14 to 20 maunds of rice, and vary in size. When alarmed, it is astonishing the rapidity with which they desert the village, carrying all their household goods; women, children and infants, pigs, fowls, &c., disappearing together. The men having placed the women and children in secure places in the jungle, now hover around, and either fire from the high ground into the village or from the edge of the same, and they seldom fire until they have selected places where the chances are 100 to 1 against their being hit. On the road, they are fond of lying up on the edge of a steep bank of a mountain stream, and having delivered their fire, immediately drop down into the bed of the stream and, keeping close under bank, escape with ease. When running away, they place panjies in the path with great celerity one behind the other, which the enemy following them have to remove before they can proceed with the chase.

Their villages are generally strongly defended at the extremities with stockade work, ditches and panjies, but they generally leave weak places on the flanks, and frequently at one of the extremities, the opposite end to which they expect the attack. On approaching a village, the advance should be slow, and men extended into the forest on either side; ambuscades may be expected when within a mile or so, and, as I have already remarked, the fact of a party disappearing into the forest greatly bothers Nagas, and makes them bolt. If ground is clear in the neighbourhood of the village, the attack should be delivered on two or more sides.

I will now conclude this paper by some account of the Kukis, a class of people we came across when in the "Kucha" Naga country, who differ entirely from their immediate neighbours and friends in almost every respect. Although many of the villages are shared by each, still they keep to their style of building which is entirely different from the Nagas. I will make extracts and abbreviations from the account in Major Butler's work, chiefly derived from official records, as I myself had not the time or opportunity to make the necessary enquiries and notes, being on the tramp through very difficult hilly country almost every day. Lieutenant Vincent, and others who afford the information, lived amongst them and visited them in their official capacities as Civil Officers.

The Kukis inhabit the Tipperah and Lushai Hills and are, therefore, close neighbours of the Burmese. The families or tribes who now live in the hills north of Cachar are said to have emigrated from Tipperah in the reign of Kishen Chunder, eighty or ninety years ago, and in the years 1828-29, Gobind Chund, Rajah of Cachar, employed them to make war on Tooleeram Senaputtee; they surprised Tooleeram, destroyed his villages, cut up and dispersed his people, and finally settled down on his lands. Having thus got possession of some land, they sent for their brethren, and several families migrated and joined them. Exterminating wars amongst themselves having compelled the Kukis to seek shelter and protection in Cachar, their attention now seems wholly given to agricultural pursuits, and they are apparently completely weaned from all desire of pursuing their old custom of perpetual war with their neighbours. They are greatly respected for their martial character, and the Anghami Nagas look on them with awe and respect. They are presided over by Rajahs and Muntris, who decide all matters of dispute brought before them; and their word is law. One among all the Rajahs is chosen chief of the clan. The person of the Rajah is considered sacred, and even when two clans go to war they avoid to the utmost killing the Rajah of either, as in that case the spirit of hostility is not satiated or suppressed until vengeance is taken, generally by some foul treachery. They are not open enemies, but move by night, surround the offending village, and at break of day make the onslaught on the unsuspecting inhabitants, slaying men, women and children indiscriminately. In 1850 the Nimzæ Nagas murdered a Kuki Rajah, about 400 fighting men were immediately collected, the village attacked, and numbers of Nagas slain, whose heads were brought in, and after the usual feasting and dancing, they were chopped into pieces and distributed.

The Kuki Rajah rules supreme; the people hold their lands by sufferance of the Rajah. All tusks of elephants are his property, and when brought in, rewards of elephants or pig's flesh are given to the men bringing the same. Should any subject conceal a tusk he is liable to a very heavy fine or perpetual slavery, in which case he is employed tilling the Rajah's land.

Theft—is also punished amongst them by heavy fines or slavery, according to the gravity of the offence.

Adultery—is punished by council of Rajah and Muntris, the offender invariably confesses his guilt and is fined, a portion of the fine being paid to the injured husband, the remainder is kept by the Council as remuneration for their trouble. A divorce is then decreed, and the offender keeps the woman.

Seduction—in the case of a maiden, the parents bring about the marriage at once, with the usual ceremonies. In the case of a widow, a fine is exacted. The chiefs or council, as it is termed, do not interfere in these matters, as in cases of adultery.

Remarriage—in the case of a "widower," he gives a feast to his late wife's relatives at the expiration of one year after a decease; after the second year he gives them another feast, then, if they are agreeable, he can marry again. In the case of a "widow" after giving feasts, &c., as performed by a widower, she can marry again after the lapse of three years, with the consent of her late husband's relatives.

Death, Burial—Customs vary with tribes; some burn their dead, and some bury; in all cases there is feasting accompanied by much drinking. After the death of a Rajah his body is smoked and dried, and is kept above ground for two months before burial; he is then interred with great honours, cows and pigs being killed to feast the whole clan, and pieces of flesh sent to other villages. The heads of the animals slain on this occasion are placed on posts arranged round the grave. His son, however young, is then elected Rajah.

Marriage—Does not take place until the age of puberty is attained. A youth desirous of marrying a certain girl, persuades his parents to visit the parents of the girl, taking with them a pot of spirituous liquor; should this liquor be accepted and the interview prove satisfactory, the young people are betrothed; the father of the boy must now pay a stated sum of money, which if he can do, the marriage is consummated without delay, if he cannot, the youth must serve the parents of the girl as a servant, for a certain term of years, after which he can claim his betrothed. The bride and bridegroom place their feet together on a large stone, and the chief or headman sprinkles both with water, after which he exclaims:—"This man has taken you to be his wife; be faithful, and have no evil communications with other men. Live with him, cheer him with liquor and meat, and make him happy all the days of his life, and may you be blessed with a numerous progeny. If you act otherwise, you will be a worthless creature, and will be heavily fined."

Religion—The Kukis appear to believe in a future state, either for happiness or eternal misery. They believe in a plurality of Gods, and offer sacrifices to them. They have no images or temples of any kind. They consider the following as acts of impiety—"Injuring the property of others, or taking the same without payment; using violence; abusing parents; fraudulently injuring another; giving false evidence; speaking disrespectfully to the aged; marrying a brother's wife; putting foot on or walking over a man's body; speaking profanely of religion."

Acts of charity of every description are held in great esteem amongst them.

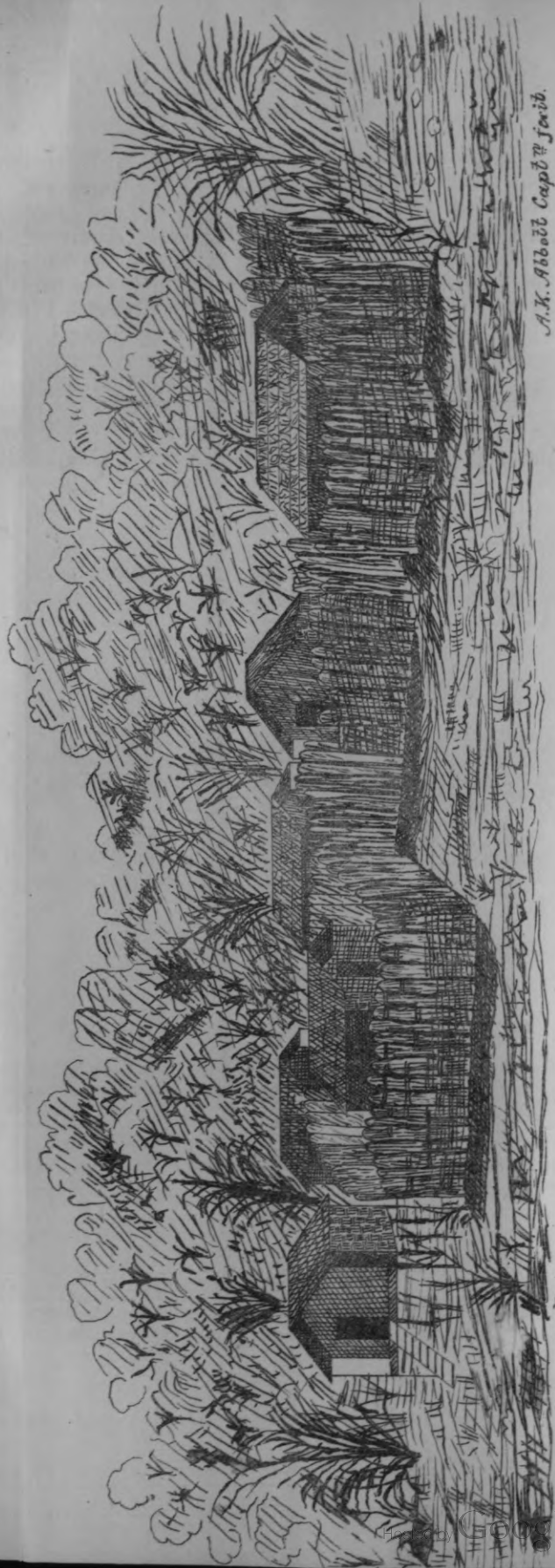
The Kukis are inveterate smokers ; men, women and children, from ninety to five years of age, have the pipe perpetually in their mouths. The men smoke an ordinary pipe made of bamboo, with bowl and stem, but the women smoke a pipe on the hubble-bubble principle, the lower part of the bowl being filled with water from which the upper part can be detached ; when well impregnated with the tobacco juice, this decoction of water and nicotene oil is carefully poured into a small receptacle made of bamboo or small gourd, and is distributed amongst the men, who carry it about, sipping it constantly, and on meeting a friend it is amusing to see the latter open his mouth and have a small quantity of this abominable decoction poured into it, after swallowing which, he smacks his lips to express his appreciation of its quality.

As appears to be the custom amongst all the hill tribes in these parts, the Kuki women do three fourths of the labour ; they are never idle ; if not working in their fields, they sit down in front of their houses and make cloth, the simplicity of the means used, and the rapidity and perseverance with which they work is wonderful, nothing distracts their attention ; the men are fond of lounging about and smoking. The men wear a large chudder, which is thrown over the shoulder, then wrapped round the body ; under this there is no other clothing, the body being stark naked. The women wear a kind of petticoat about 18 inches in breadth which is wrapped round the waist and extends half way down the thighs, and over all a thick chudder.

The men also wear a kind of havresack made of net work, which is slung over the shoulder, and in it their smoking and other implements are carried. The hair is tied in a knot on the top of the head secured with a metal skewer passed through it. The ears are bored and stretched over silver or brass rings varying in size up to 5 inches. The women wear their hair plaited at the back, the two ends being brought round in front and tied just above the forehead in the form of a coronet.

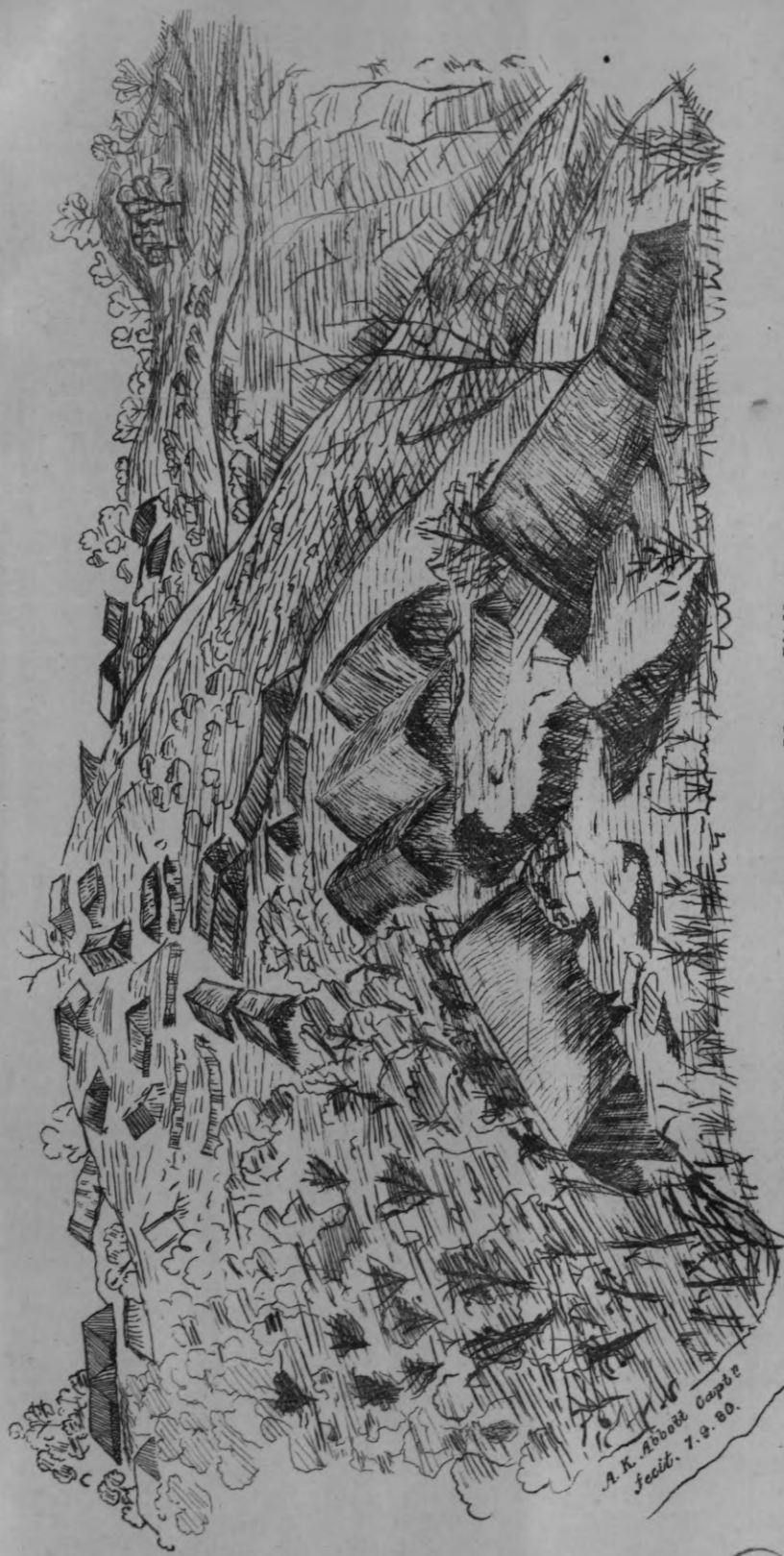
"The sites of the Kuki villages are well chosen on the broadest parts of the highest ridges, with water near at hand, generally a small hill stream. Some of the chief villages contain as many as 200 houses, commodiously built on platforms raised between three and four feet from the ground. Every part of the house is formed of bamboo, there being but few trees of any kind, and little or no grass in northern Cachar, as the character of the whole country is a dense forest of bamboo. The posts of the houses are bamboos driven deep into the ground ; the walls are formed of split bamboos, of which the platform also is made, and the thatch is composed of bamboo leaves neatly put on. For greater security against the inclemency of the weather, an outer covering of split bamboos, fastened together, is occasionally laid over the thatch. The house is divided into two rooms of tolerable size."

The above is a very accurate description of a Kuki house ; but the country we passed through, where Kuki villages are situated, is covered with dense tree, grass and bamboo forest, and although the Kacha Nagas use grass for thatch, the Kukis adhere to their own style of building, using nothing but bamboo. Every Kuki house is more or less fenced in by a kind of stockade, to hold their cattle, which are the mithun already alluded to. The approach to a Kuki village is most park-like, the mithun having eaten away the undergrowth, leave nothing but the large trees standing separately ; the village is seldom visible until it is almost entered, as it is well hidden by trees. The Rajah, or headman of each village, has generally a very large house, as compared with the rest, and surrounded by a well constructed stockade, within which inhabitants can take refuge in case of attack from outside.



A.K. Abbott Capt & family.
28.2.80

Portion of a KUKI Village. Houses raised on machans & fenced in.

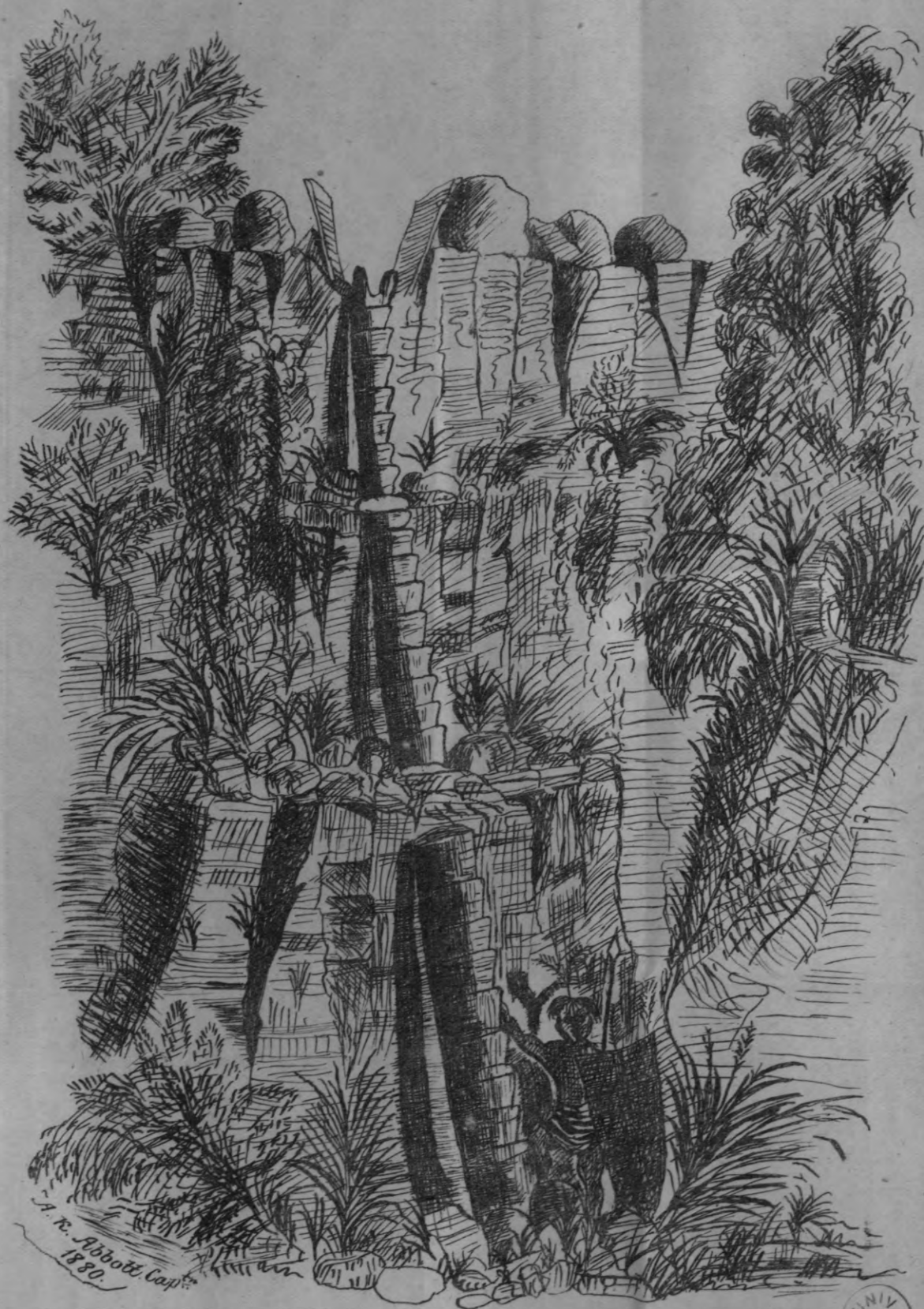


SAMAGUTING *Angami Naga Village.*

A. K. Addo's Capt?
Sept. 7. 9. 80.



Kucha Naga Village "GHAMA". - Northern entrance.



A. R. Abbott Cap.
1880.





Portion of Kacha Naga Village LAKHEMA

A. H. Abbott Capt. U.

B S C 1880



Angami Naga House

Side View



Front View.



Kacha Naga House.

Side View



3/4 Front View



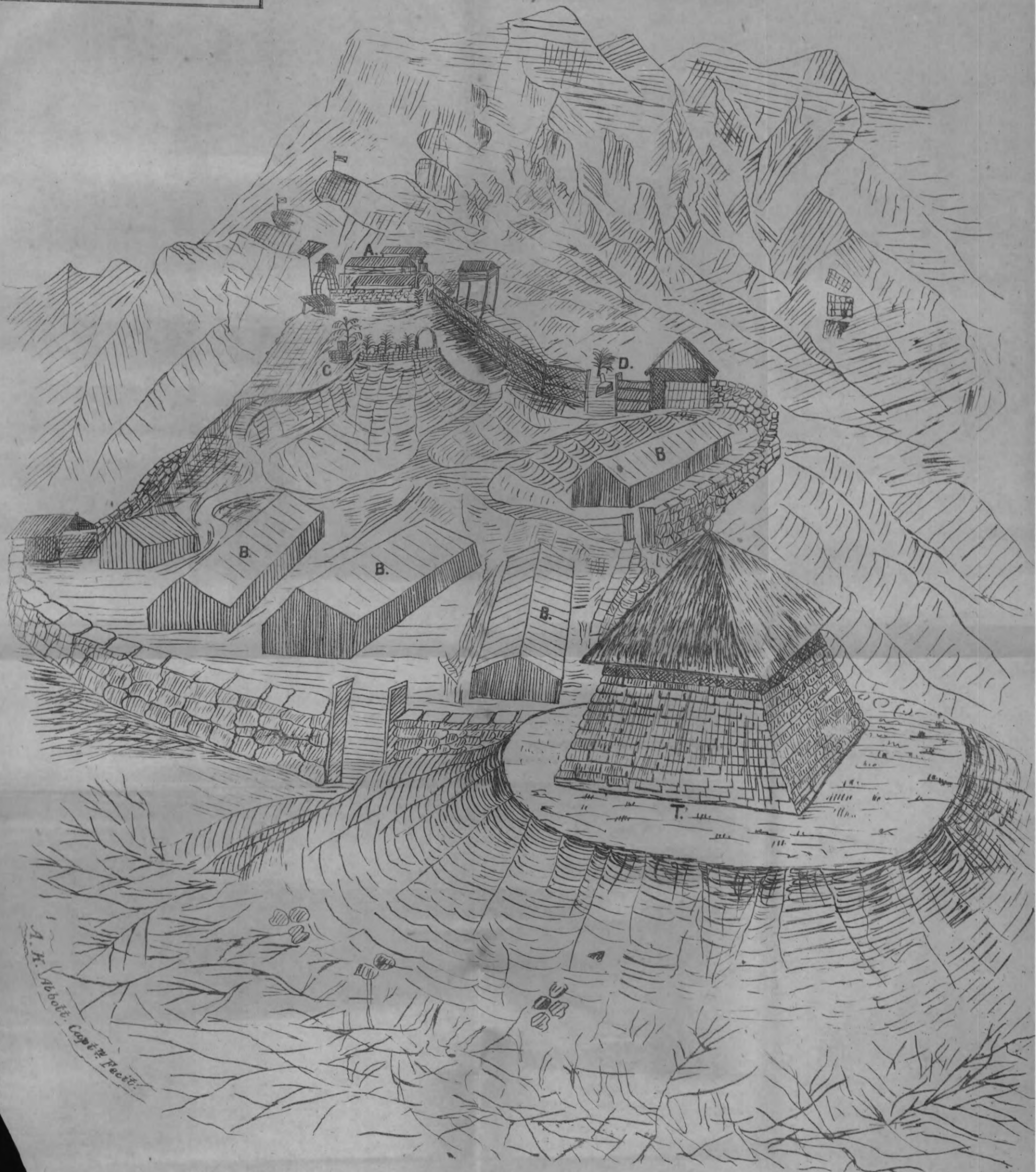
A. K. Abbott Capt^y
Bengal Staff Corps. 1880.

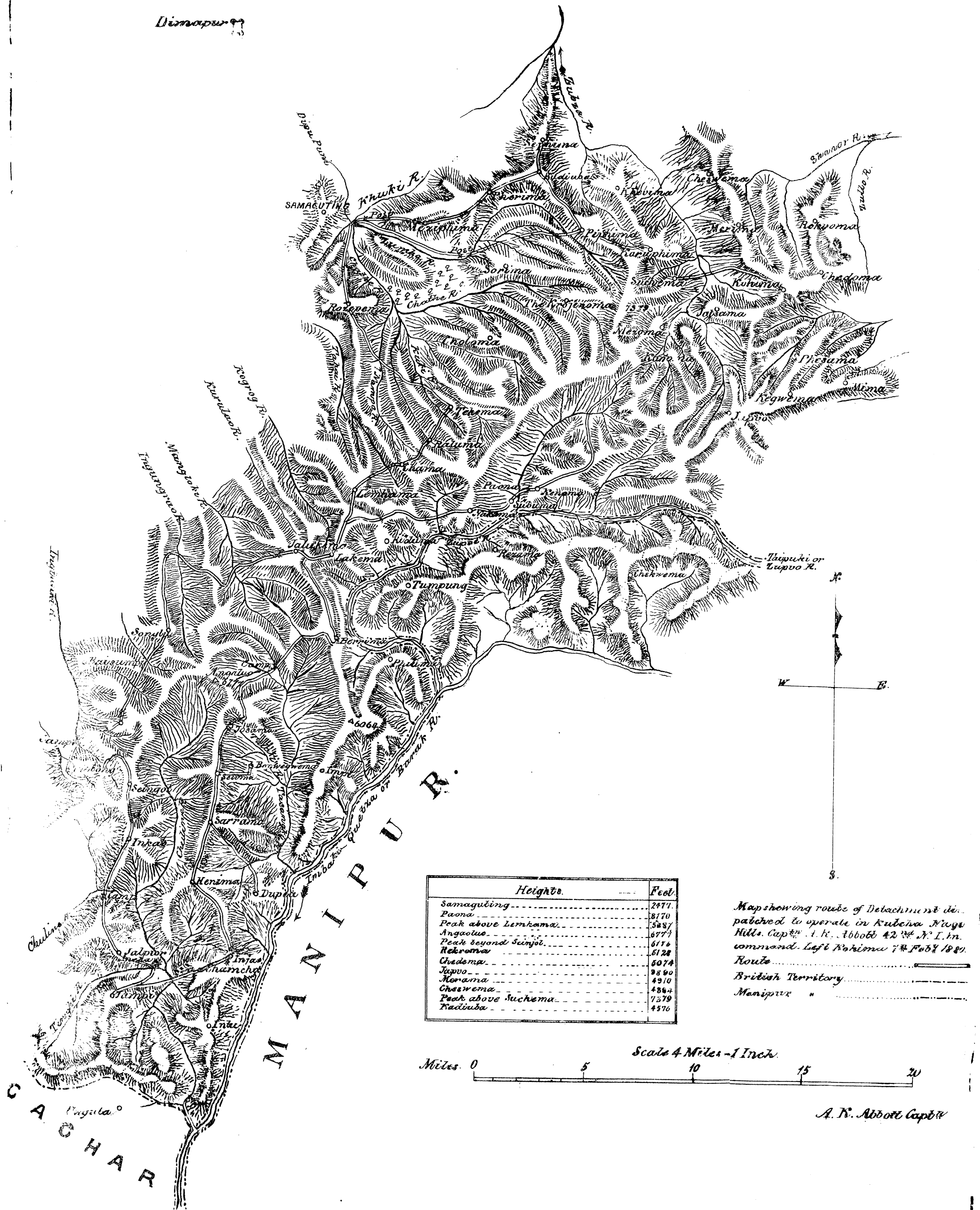


"KONOMA" NAGA HILLS as it now is, with a view of Chakar Fort's ridge.

Reference.

- A. Officers Bungalows.
- B. Barracks.
- C. Major Cock's grave.
- D. Mr. Damant's do.
- T. Square Stone Redoubt.
- Chakar Fort.





II. THE RUSSIAN CAVALRY

BY
LIEUTENANT J. M. GRIERSON, R. A.

Having had the good fortune to be present at the Russian camps of exercise near Warsaw in the summer of 1880, and having seen a good deal of the Russian Cavalry and had opportunities of visiting their barracks, stables, &c., I venture to hope that my notes, enlarged and added to from various Russian, French and German works, may prove of interest, more especially as I am not aware of any detailed account of the Russian Cavalry having been published in English of later date than 1871.

I. GENERAL ORGANIZATION.

In time of peace the Russian Cavalry, stationed in Europe, is composed of:—

- 4 Regiments of Guard Cuirassiers.
- 16 Do. Dragoons (2 of the Guard).
- 16 Do. Lancers (2 do.).
- 16 Do. Hussars (2 do.).
- 21 Do. Don Cossacks (1 of the Guard).
- 26 Batteries of Horse Artillery (5 of the Guard).
- 8 Do. Don Cossack Horse Artillery (1 Guard).

These are divided into two divisions of the Guard, fourteen of the Line, and a division of Cossacks, leaving two Cossack Regiments independent. The 1st Guard Division contains the four Cuirassier regiments, two of which are stationed in St. Petersburg, one in Tsarskoe Selo, and one in Gatchina with the 1st and 4th Guard Horse Batteries in St. Petersburg. Of the 2nd Division, the 1st Brigade (Horse Grenadiers and Guard Lancers) is at Peterhof; * the 3rd Brigade (Emperor's Lancers and Grodno Hussars) with the 3rd Battery at Warsaw; and of the 2nd Brigade the Guard Dragoons are at Kretchevitski, † the head quarters and Guard Hussars at Tsarskoe Selo, while the Guard Cossacks and 2nd, 3rd and Cossack Batteries are at St. Petersburg.

To each army-corps of the line is attached a division of cavalry bearing the same number, and composed of a Dragoon and a Lancer Regiment, forming the 1st Brigade, an Hussar and a Cossack Regiment forming the 2nd, all bearing the same number as the division, and two Horse Batteries. The first fourteen batteries are attached in pairs (1st and 2nd, 3rd and 4th, &c.) to the first seven divisions; the 15th to 21st in order, to the last seven, and with those are brigaded in order the 1st to 7th Cossack Batteries. Four of the Cossack Regiments (15th to 18th) form an independent division unattached to any army corps, and the Grenadier and 15th Corps have no Cavalry.

* Near St. Petersburg.

† Government of Novgorod.

According to the "Short List of Land Forces, 1880," the following are the stations:—

Division.	Head Quarters.	Dragoon Regiment.	Lancer Regiment.	Hussar Regiment.	Cossack Regiment.	Artillery.
I.	Tver.	Tver.	Rocheff.	Moscow.	Torschok.	Tver.
II.	Souvalki.	Wilkievicki.	Mariampol.	Souvalki.	Augustovo.	Souvalki.
III.	Kovno.	Rossieni.	Kovno.	Libau.	Telschi.	Keidani.
IV.	Bielostok.	Bielostok.	Sloium.	Nesivitch.	Lida.	Bielostok.
V.	Vlotslavsk.	Konin.	Vlotslavsk.	Kalicz.	Wielun.	{ 9. Sieradz. 10. Zdunskavola.
VI.	Lonja.	Schutschin.	Lonja.	Lipno.	Szrensk.	{ 11. Radzynin. 12. Ostrolenka.
VII.	Elisavetgrad.	Novo Georgievsk.	Novormingorod.	Elisavetgrad.	Odessa.	{ 13. Novgorodka. 14. Novo Starodub.
VIII.	Kischinev.	Ismail.	Bolgrad.	Kischinev.	Bielzi.	{ 15. Kischinev. 1. c. Soroki.
IX.	Romny.	Romny.	Lubny.	Priluki.	Choral.	Rysk.
X.	Tchuguiev.	Sumi.	Achtyrka.	Tchuguiev.	Woltschanek.	Izium.
XI.	Dubno.	Kremenetz.	Dubno.	Luszk.	Vladimir-Volhynsk.	{ 18. Rovno. 4. c. Ljubar.
XII.	Kieff.	Karnenetz-Podolsk.	Jarmolinezy.	Meschibusch.	Kieff.	Meschibusch.
XIII.	Riasan.	Riasan.	Kolomna.	Kozlov.	Borisovo.	{ 20. Borisovo. 6. c. Sarusk.
XIV.	Tchenstokov.	Starzoff.	Pinczeff.	Tchenstokov.	Miechov.	{ 21. Kielce. 7. c. Filica.
Cossack.	Zamost.	15. Tomasoff.	16. Zamost.	17. Janov.	18. Bielgorai.	—

The 19th Cossacks are at Abo, the 20th at Novotcherkask.

By reference to a Map (Hauptmann von Tröltzsch's "Map of the Distribution of the Russian Army," is the best), it will be seen that the western frontier of Russia is covered by a thick chain of cavalry, a disposition which is rendered necessary by the paucity of railroads in Russia, and the consequent length of time it would take to concentrate the army for war with a western power. These cavalry divisions, with their strong effective (the peace footing actually exceeds the war establishment), and supported by the rifle brigades, also stationed on the frontier, would thus, from the outbreak of hostilities be disposed to prevent hostile raids, watch the frontier, and cover the strategic deployment of the army. Thus the 2nd, 3rd, 4th, 5th and 6th Divisions watch the Russian frontier, and the 11th, 12th, 14th and Cossacks the Austrian; while, as a central reserve, the 3rd Brigade, 2nd Guard Division, stands at Warsaw. On the Roumano-Turkish frontier is the 8th Division, supported by the 7th, 9th and 10th, while near Moscow the 1st and 13th, and at St. Petersburg the two guard divisions, may be regarded as reserves.

II. ORGANIZATION OF REGIMENTS, &c.

The regular cavalry regiments are all organized precisely alike and have nearly the same effective in peace as in war. All regiments have four field and one reserve (zapasnii) squadrons. Each active squadron is composed as follows;—

- 1 Squadron leader (Major in the Army), Captain (Rotmistr) in the Guard.
- 1 Captain (Rotmistr).
- 1 Staff Captain (Shtabs-Rotmistr).
- 2 Lieutenants (Poruchek).
- 1 Cornet (Kornet) Ensign (Praporshcheek) in the Dragoons.
- 6 Officers.
- 1 Sergeant-Major (Vachtmistr).
- 4 Section-Sergeants
- 1 Quartermaster-Sergeant.
- 10 Mounted } Under Officers.
- 1 Unmounted }
- 4 Trumpeters.
- 128 Privates
- 4 Volunteers.
- 27 Dismounted men.
- 152 Troop Horses (including 4 of Volunteers).

So that we may take a squadron at 6 officers and 152 men mounted and 28 dismounted, or roundly, 150 sabres. The four volunteers

and their horses are borne supernumerary to the establishment in peace, but in war are counted among the 128 men (64 files in 4 sections), thus making the war strength of a squadron 6 officers, 148 men.

The regimental staff is composed of:—

- 1 Regimental Commander (Major-General in Guard, Colonel in Line).
- 2 Divisional (Wing) Commanders (Colonels in Guard, 1 Colonel 1 Lieut-Colonel in the Line).
- 1 Administration Officer.
- 1 Adjutant.
- 1 Paymaster.
- 1 Quartermaster.
- 1 Armament Officer* (Maître d'Armes.)
- 1 Trumpet Major and 1 troop horse.

In all 8 officers, 1 man and 1 horse.

The total combatant strength of a regiment is, therefore,
 Peace, 32 Officers 64 Non-Commissioned Officers—17 trumpeters—528 privates—609 horses.
 War 32 „ 64 „ 17 „ 512 „ 593 „

Each squadron has also in war 30 dismounted men and those of the whole regiment are united under the command of an officer although classed in official returns as “combatants.” The non-combatant portion consists of 6 officials (2 surgeons, 1 veterinary surgeon, 1 administrative official, 1 chaplain and 1 riding master) and 142 (in war 143) men, (hospital orderlies, armourers, saddle-makers, shoeing smiths, tailors, officers servants, train drivers, &c.). The following is the strength of the regimental transport;—

1	Ammunition waggon with 1 Driver and 4 horses.				
1	Archive	Do.	1	„	4 „
5	Provision	Do.	5	„	20 „
1	Treasure	Do.	1	„	4 „
1	Tool	Do.	1	„	4 „
1	Hospital store	Do.	1	„	4 „
1	Ambulance	Do.	1	„	4 „
1	Surgery	Do.	1	„	4 „
1	Medicine cart		1	„	1 „
	Horses for Non-Combatants,				8 „
	Spare,				3 „

Total ...13 Waggon. 13 Drivers. 60 Horses.

Dragoon regiments have 2 ammunition waggons, and, therefore, 14 waggons, 14 drivers and 64 horses. In the above and in the following figures, officer's horses (except in the Cossacks) are not counted in as they provide their own.

To recapitulate, a regiment has †:—

Mounted Combatants	{	Officers,	Peace 32	War 32				
		Men,	609	593				
		Troop Horses,	609	593				
Dismounted Combatants	{	Officers,	1	1				
		Men,	120	120				
Non- Combatants	{	Officials,	6	6				
		Men,	142 ⁽¹⁾	143 ⁽²⁾		{	Dragoons.	
		Horses,	60 ⁽³⁾	(1)				143.
				(2)				144.
				(3)	64.			

Dragoons.
(1) 143.
(2) 144.
(3) 64.

A few explanations are necessary as to the duties of the various officers. A regiment is divided into two divisions, each of two squadrons, and commanded by superior officers. A squadron is also commanded by a superior officer and is divided into four sections commanded by the captain, the two lieutenants, and the cornet. The staff captain acts in a measure like the captain of an English battery and may fitly be termed "squadron adjutant." All officers of the Guard (except those of the Empress Cuirassiers and Ataman Cossacks) rank with officers of the line two grades above their own, the officers of the two named regiments, (Young Guard), with those one grade above them. All appointments as squadron and division leaders are given by selection, as in Russia the motto is "Rank gives no title to command."

We now pass to the reserve squadrons, of which each regiment has one. Formerly these squadrons trained the recruits and remounts, but recently the former function was taken away from them and their duties are now in peace only to gather and break in young horses, but in war the duties of training recruits and the formation of marching (*ersatz*) squadrons to fill up gaps in the ranks of the regiment are also assigned to them. The squadrons are united in brigades of six, commanded by Lieutenants General or Majors General, and each corresponding to two Divisions of the active army (1st Brigade to 1st and 2nd Divisions, &c.). The Guard reserve squadrons remain with their regiments, except those of the 3rd Brigade, 2nd Division, which are at Pavlovsk, but those of all the line divisions are quartered in the centre of Russia in the great horse-breeding districts. The squadrons are scattered in the various villages with the head quarters of brigades as follows:—

1st Riasan	{	Government of	4th Bobrov	{	Government of
7th Riaisk			5th Pavlovsk		
2nd Ostrogojsk	{	Government of	6th Bogutchar		
3rd Birnouth					Voronej.

A reserve squadron has three different classes of men in its ranks, the cadre, the variable effective, and a remount detachment. These are composed as follows:—

† Note. The Chevalier and Horse Guards have each a band of 43 men. In other regiments the trumpeters form the band.

				Privates.		
Officers.		Non-Commnd.	Officers.	Trump.	Combatant.	Non-Combatant.
Cadre	7	26	4	100	47	
		(10 dismounted).				
Variable effective		—	—	30	—	
Remount dett.		3	—	32	2	
Horses	Cadre		39			
	Remounts		81			
	Draught		4			

Every year two officers are sent from each division to bring from the reserve squadrons the horses necessary for the annual remount, and these are taken to the regiments by men of the variable effective, who do not return but are incorporated in the annual contingent of recruits. In war, marching squadrons are formed by the reserve squadrons, of reserve men, to fill up gaps in the ranks. They consist of:—

3 Officers.

28 Non-Commissioned Officers.

8 Trumpeters.

220 Privates.

12 Non-Combatants.

180 Horses.

Proposing to return later to the organization of the Don Cossacks, the following details are necessary to arrive at the total strength of the Russian Cavalry. The mixed Guard Regiment is composed of two divisions of two squadrons in peace, one called "The Emperor's Cossack Division," the other the "Ataman Cossack Division." In war each of those divisions is augmented into a regiment of six squadrons. The twenty line regiments have each six "Sotni" in all of:—

			Combatant. Private.			
Officers.	Non-Commnd.	Officers.	Trump.	Mounted.	Unmounted.	Official. Non-Combt.
Peace.	32	56	19	798	30	1 53.
War.	21	86	19	791	—	1 57.
Horses:—	Officers &	Troop	907			
	Non-Combatant		23			
	Draught		3			
	Pack		72			
	1 Archive	waggon.				

In war the 2nd and 3rd categories furnish each twenty regiments of the same strength, giving a total of 62 regiments.

The strength of a Guard or Line Cossack Horse Battery is:—

			Gunnars.	
Officers.	Non-Commissioned	Officers.	Trump.	Combatant. Non-Combatant.
Peace	6	14	3	175 34
War	7	20	3	215 40

Horses.	Peace.	111	riding.	53	draught.	6	train.
	War.	111	„	103	„	42	„
Carriages.	Peace	6	guns.	2	amm.	waggon.	
	War	6	„	8	„	„	1 spare carriage. 3 forage carts.

One battery in each division (the 1st, 3rd, 5th, 7th, 9th, 11th, 13th, 14th to 21st, 1st, 2nd and 3rd Guard), has in addition, a surgeon, veterinary surgeon, a riding master, and six non-combatants.

The following table shews the composition of a Cossack Horse Battery.

		Drivers				Horses	
		Officer.	Non-Comm.	Officers.	Combatant.	Non-Combat.	Riding* Draught.
Peace	Guard Battery (4 guns)	5	9	121	23	78	40.
	Line Battery (6 guns)	8	14	178	24	112	59.
War	Guard Battery (6 guns)	6	20	221	31	151	133.
	Line Battery (6 guns)	6	20	218	31	148	133.

Finally, to each cavalry division is attached in war a park section of 24 four wheeled ammunition waggon and 1 tool cart, with 2 officers, 9 non-commissioned officers, 1 trumpeter, 130 men combatants, 18 non-combatants, 1 official, 4 riding, 169 draught horses.

We now can proceed to consider the total war strength of the Russian cavalry. On mobilization, the Guard is formed into three divisions as follows:—

1st Division:—Chevalier Guards, Horse Guards, Emperor's Cuirassiers, Empress' Cuirassiers. (Ural Cossack Sotnia) 1st and 4th Batteries.

2nd Division:—Horse Grenadiers, Guard Lancers, Emperor's Hussars, Emperor's Cossacks, 2nd and 5th Batteries.

3rd Division:—Guard Dragoons, Emperor's Lancers, Grodno Hussars, Ataman Cossacks, 3rd and Cossack Batteries.

No change takes place in the line divisions.

The staff of a division consists of:—

- | | |
|---------------------------------|---------------|
| 1 Lieutenant General-Commanding | } 5 Officers. |
| 1 Chief of the Staff | |
| 2 Staff Officers | |
| 1 Surgeon Major | |

18 Men, 12 draught horses, 1 spare horse, 3 carriages.

A brigade Staff consists of:—

- | | |
|----------------------------|---------------|
| 1 Major General Commanding | } 2 Officers. |
| 1 Staff Officer | |
| 5 Men. | |

* Including Officer's Horses.

The following is the strength* of the various division :—

		Combatants (Mounted).			Non-Com- batants.		Guns.	Other Carriages.	REMARKS.
		Officers.	Men.	Horses.	All ranks.	Horses.			
1st Guard Division.	Staff	9	—	—	28	13	—	3	Ural Cossack Squadron not included. It would be broken up as personal escorts.
	4 Cav. Regts. ...	128	2372	2372	1080	240	—	52	
	2 Batt. H. A. ...	14	476	428	89	84	12	24	
	Amm. Sect....	2	140	173	19	—	—	25	
	Total...	163	2988	2973	1216	391	12	104	
Each of 2nd Guard and 1st to 7th Line Divisions.	Staff	9	—	—	28	13	—	3	
	3 Cav. Regts. ...	96	1779	1779	811	184	—	40	
	1 Coss. Regt. ...	21	886	907	58	98	—	1	
	2 Batt. H. A. ...	14	476	428	89	84	12	24	
	Amm. Sect. ...	2	140	173	19	—	—	25	
	Total...	142	3281	3287	1005	397	12	93	
Each of 3rd Guard and 8th to 14th Line Divisions.	Staff	9	—	—	28	13	—	3	(1) 241 in 3rd Guard Division. (2) 3284 in 3rd Guard Division.
	3 Cav. Regts. ...	46	1779	1779	811	184	—	40	
	1 Coss. Regt. ...	21	886	907	58	98	—	1	
	1 Batt. H. A. ...	7	238	214	49	42	6	12	
	1 Batt. Coss. H. A.	6	⁽¹⁾ 238	281	31	—	6	12	
	Amm. Sect. ...	2	140	173	19	—	—	25	
	Total ..	141	3281 ⁽²⁾	3354	996	337	12	93	
Independent Cossack Division.	Staff	9	—	—	28	13	—	3	(3) No artillery in permanence in peace. In 1877, 16th and 17th Don Cossack Batteries attached.
	4 Coss. Regts. ...	84	3544	3628	232	392	—	4	
	2 Batt. Coss. H. A. (3)	12	476	562	62	—	12	24	
	Amm. Sect....	2	140	173	19	—	—	25	
	Total ...	107	4160	4363	391	405	12	56	

* Cavalry dismounted men are here classed as Non-Combatants. Officers' horses are included in the Cossacks, but not in the Regulars.

In 1877, two other independent Cossack Divisions were formed as follows:—

2nd Division. 24th, 36th, 38th and 39th Regts. 19th and 21st Batteries.
3rd Division. 22nd, 25th, 32nd and 33rd Regts. 18th and 29th Batteries.

Taking now the combatants of cavalry and the numbers of guns only, we get:—

1 Division @ 16 squadrons, 2 Batteries or 137 Officers, 2372 Men, 2372 Horses, 12 Guns.
16 Divisions @ 12 „ 6 sotni 2 „ or 126 „ 2665 „ 2686 „ 12 „
1 Division @ 24 „ 2 „ or 93 „ 3544 „ 3628 „ 12 „
42 Cossack Regts. @ 6 „ or 21 „ 886 „ 907 „ 6 „
12 Batteries @

Total 208 squadrons } 3128 officers, 85,768 men, 87,070 horses.
372 sotni
288 guns.

In none of the above figures have we counted in the Ural Cossack Guard Squadron, the Tartar formations in the Crimea, or the 15th to 18th Regiments of Dragoons stationed in the Caucasus.

III. CLOTHING, ARMAMENT AND EQUIPMENT (REGULARS).

Cuirassiers.—The troops consist of 4 regiments named and with distinguishing colours, &c., as follows:—

	<i>Facings.</i>	<i>Buttons.</i>	<i>Horses.</i>	<i>Lance-staves.</i>
Chevalier Guards.	Scarlet	White	Light Bay	Scarlet.
Horse Guards.	Scarlet	Yellow	Black	Dark Blue.
Emperor's Cuirassiers.	Yellow	White	Dark Bay	Yellow.
Empress's Cuirassiers.	Light blue	Yellow	Chesnut	Light Blue.

In 1859, the Cuirassiers of the line were incorporated with the Dragoons.

The uniform consists of white tunics, with collars and facings of the above colours, of almost exactly the same cut as those worn by German Cuirassiers, dark blue overalls worn over the boots, with two broad stripes of the same colour as the facings, copper cuirasses and helmets, with a copper eagle on the crest, and white gauntlets. The above is the parade uniform. On ordinary occasions, grey-blue pantaloons with stripes, are worn inside the boots, a spike replaces the eagle on the helmet, and when not on parade short gloves are worn. The cuirasses are very heavy, some even reaching 40 Russian pounds, and are of iron, padded inside, and covered with a thin layer of copper. In undress, dark green tunics with the various facings, and white forage caps with peaks and bands of the colour of the facings, are worn. The great coats are of the universal army pattern, of stout greyish-brown cloth with long skirts to about 10 inches from the ground, with collar patches and shoulder-straps of the regimental colour. Hoods (bashlik) of the universal pattern are also worn. These have high peaked tops and long ends which may either be crossed on the breast and tied behind or wrapped round the throat. The cuirass is put on over the greatcoat in winter. The Chevalier and Horse Guards, when on duty in an imperial palace, have also scarlet cloth cuirasses, richly embroidered, and at court their officers wear scarlet tunics. The equipment of the Cuirassiers consists of a white waist belt to which the

sword is suspended on the left, and revolver on the right side, in a brown leather case. To a ring in the butt of the revolver is fixed a cord, black, gold and red for officers, of the colour of the facings for the men, which passes round the neck and hangs over the breast, thus preventing the revolver from falling. The pouch belt is white.

The arms are the sword, the revolver, and the lance. The former is much the same as the German "Pallasch," with a straight blade, weighing 28lb. The revolver is the Smith and Vesson (6-barrelled). All ranks have the above arms and, in addition, the front rank have lances about 6 feet long with flags of various colours and staves painted as in the above table.

Dragoons. The following is a list of the regiments of Dragoons in the Russian Army :—

<i>Regiment.</i>	<i>Facings.</i>	<i>Buttons.</i>	<i>Regiment.</i>	<i>Facings.</i>	<i>Buttons.</i>
Horse Grenadiers	Scarlet	White	7th Kinburnski	Yellow	White
Guard Dragoons	Scarlet	Yellow	8th Astrachanski*	Yellow	Yellow
1st Leib-Moscovski	Scarlet	White	9th Kazanski	Scarlet	White
2nd Leib-Pskovski*	Rose	Yellow	10th Novgorodski*	Scarlet	Yellow
3rd Novorossiiski	Sky Blue	White	11th Rijski	Sky Blue	White
4th Ekaterinoslavski*	Sky Blue	Yellow	12th Starodubovski*	Sky Blue	Yellow
5th Kargopolski	White	White	13th Voennyi Orden*(1)	Orange	White
6th Gluchovski*	White	Yellow	14th Malorossiiski*	Yellow	Yellow

The regiments are invariably called by their names and not by their numbers, as throughout the army. The tunics are dark green and single-breasted, except in the Guard, where they are double-breasted with scarlet turnbacks in full dress ; cuffs, collars and shoulder-straps are of the regimental colour. The pantaloons are greyish-blue with piping of the colour of the facings, and are invariably worn tucked into the boots which are of the same pattern as those of dismounted troops and lancers. Mounted troops only add heel spurs, with very large jingling rowels, to those boots, which are made of most excellent leather, and are the best we have seen in any European army. The head-dress is a felt shaco, covered with black cloth, with the Russian eagle in front, and, in full dress, a black falling horse-hair plume. The forage cap is dark green with a band of the regimental colour, and of the same cut as the well known German "Feldmütze." The greatcoat is of the general pattern and has a collar patch and shoulder-strap of the same colour as the facings.

There are a few differences to be noted in the Guard. Both regiments have dark green overalls for full dress with two broad scarlet stripes, scarlet and green cloth girdles, and yellow lace on the collars and cuffs. The Grenadiers have a black leather helmet with an eagle in front, a bearskin crest from ear to ear, and a long scarlet colpack or bag hanging down behind. They also wear scarlet epaulettes. The Guard Dragoons have copper shoulder-scales and black leather helmets with, (in full dress), white plumes. The first eight line regiments have green collars and collar-patches of the regimental colour ; the last six, collars of the colour of the facings with green patches, except in the

* Transformed in 1859-60 from a Cuirassier regiment.
(1.) Regiment of the Military Order of St. George.

13th Regiment, in which they are of black velvet. White linen tunics are worn in summer. As in the entire line cavalry, officers have the same uniforms as the men but with silver or gold for woollen lace, one bar of silver or gold lace on the collars and cuffs, like our life Guards, silver or gold pouch-belts, and silver, black and yellow revolver cords.

Dragoons are armed with rifles and sabres. The former are of the Berdan pattern and are carried in brown leather cases slung over the back and held in position by a brown leather belt over the left shoulder. The case is closed at the end by a flap and button. A black shoulder belt over the left shoulder supports the two cartridge boxes, for 20 rounds each, which are slung on the waist belt, while over the right shoulder the sword belt of black leather passes, to which the sword is fastened as shewn is fig. 9. Outside the scabbard is carried the bayonet in its scabbard. The waist belt, passing round all the shoulder belts, steadies them. The sword scabbard is of black leather with brass mountings, and the swords themselves (*shashka*), are broad in the blade, slightly curved, and with a single bar guard. In the Guard the belts are white. The revolver is carried by officers, non-commissioned officers, and trumpeters, as described for Cuirassiers.

Lancers. These regiments have numbers, names and facings, &c., as follows:—

	<i>Facings.</i>	<i>Buttons.</i>		<i>Facings.</i>	<i>Buttons.</i>
Guard Lancers.	Scarlet	Yellow	7th Olviopolski.	White	White
Emperor's Lancers.	Scarlet	White	8th Vosnesenski.	Yellow	do.
1st St. Petersburgski.	Scarlet	Yellow	9th Bugski.	Scarlet	Yellow
2nd Leib-Kurlandski.	Sky Blue	do.	10th Odesski.	Sky Blue	do.
3rd Smolenski.	White	do.	11th Tchuguevski.	White	do.
4th Charkovski.	Yellow	do.	12th Bielgorodski.	Yellow	do.
5th Litovski.	Scarlet	White	13th Vladimirski.	Yellow	do.
6th Volhynski.	Sky Blue	do.	14th Yamburgski.	Sky Blue	White

The tunic (*ulanka*) of the lancers is dark blue and double-breasted, with turnbacks, collars, piping and cuffs of the regimental colour, with girdles of blue and the same colour, and shoulders-scales of the same metal as the buttons. The remarks on the pantaloons, boots, greatcoats, distinguishing marks of officers, and arrangement of the colours on the collars,† made under the heading of Dragoons, apply equally to Lancers. The head-dress is a small "shapka," or lancer cap, of black leather, worn very much over the right ear, with a cloth cover for the upper part, of the regimental colour (except in the Emperor's and 14th Regiments, where they are yellow), metal scale chin-straps, black horse-hair plumes, and lines of white or yellow worsted passed round the neck and ending in a tuft hanging on the left breast. The forage cap is dark blue, of the same cut as for dragoons, with a band of the colour of the facings (except in the Emperor's Lancers where it is yellow). On parade, the Guards have dark blue overalls with two broad scarlet stripes, and, as distinctive marks, have the guard eagle on their caps and two bands of yellow lace on each side of the collar and one on each cuff. In the line, the 1st, 2nd, 3rd, 4th, 6th, 11th, 13th, and 14th Regiments have also one

† In the 13th and 14th Regiments the collar is entirely of the colour of the facings.

bar of lace on their collars as an honourable distinction. The arms of the lancers are, for men of the front rank, sabre, revolver and lance; for men of the rear rank, sabre and carbine; and for officers, non-commissioned officers, and trumpeters, sabre and revolver. The sword (*sablya*) weighs $2\frac{1}{2}$ lbs, is much curved, broad in the blade, with a two-barred brass guard, and is carried in a steel scabbard attached by slings to the waist belt, which is worn under the tunic. The lance is the same as that of the cuirassiers, with various coloured flags, and is carried as in our service. The carbine and revolver are carried as before described, the latter on the girdle.

The following are a few details of the carbine (Berdan, No.2):—

Calibre	10·07 mm.	Weight of bullet	24 gr.
Total length	·98 m.	do. charge	5·06 gr.
Weight	2·815 kilog.	do. cartridge	42·5 gr.

It has a bolt breech-block which is prevented from being jerked out by a screw. The cartridge is the same as that for the infantry rifle, and the carbine is sighted up to 600 paces. It has a sling of brown leather. The pouch, for 20 rounds, is suspended to a white leather belt over the left shoulder.

Hussars. There are 16 Hussar Regiments, *viz* :—

<i>Regiment.</i>	<i>Dolman (tunic).</i>	<i>Buttons and Lace.</i>	<i>Shaco.</i>
Emperor's Guard	Scarlet	Yellow	Scarlet
Grodzenski Guard	Light green	White	Crimson
1st Sumski	Light blue	Yellow	Scarlet
2nd Leib-Pavlogradski	Dark green	do.	Light blue
3rd Elisavetgradski	Light blue	do.	White
4th Mariupolski	Dark blue	do.	Yellow
5th Alexandriiski	Black	White	Scarlet
6th Kliastitski	Dark blue	do.	Light blue
7th Bielorossiiski	Light blue	do.	White
8th Lubenski	Dark blue	do.	Yellow
9th Kievski	Dark green	Yellow	Scarlet
10th Ingermanlandski	Light blue	do.	Light blue
11th Iziunski	Dark blue	do.	White
12th Acktirski	Brown	do.	Yellow
13th Narvski	Light blue	White	do.
14th Mitavski	Dark green	do.	do.

The hussar tunic is almost of exactly the same cut as that in use in the German army and is of the colours stated above. The pantaloons are madder-red and cut tight with pipings of the same colour as the lace on the tunic, except in the Guard Hussars, where they are dark blue, and in the Grodzenski Regiment in which crimson pantaloons are worn. The shaco is of the same shape as that worn by dragoons, with the Russian eagle in front and covered with cloth of the above colours. In full dress a black horse-hair falling plume (white in the Guard) is worn. Actually, however, the Guard and Grodno Hussars are still wearing out their busbies (abolished in 1875), with busby-bags of the same colour as the regulation shaco. The forage cap is of the general pattern, and is of the colour of the tunic, with a band the colour

of the shaco and pipings the same as the lace. The greatcoat has shoulders-straps and collar-patches of the colour of the tunic, edged with cloth the colour of the shaco. The boots are cut open in front like those of the Austrian Hussars. In the Guard, pelisses are worn, white with yellow lace for the Emperor's, light green with white lace for the Grodno Regiment, and both trimmed with fur, and yellow lace on the collars and cuffs of the tunics. The 2nd Hussars have also such lace, but white with a thin blue stripe, as an honorary distinction. In the Guard the pantaloons are decorated with a knot in front of the thigh, as in the Austrian service, and both regiments have richly ornamented sabretasches of the same colour as the shaco. The remarks on officers' dress, under the heading of Dragoons, and those on equipment and armament, under that of Lancers, apply equally to Hussars.

Horse Artillery. The uniform of this arm is dark green tunics, single-breasted for the line, double-breasted with black velvet turnbacks for the Guards, with black velvet cuffs and collars (with yellow lace in the Guard) and scarlet shoulder-straps. The head-dress is, in the Guard, a black leather helmet with a white plume in full dress, otherwise a spike, in the Line, a dragoon shaco. Scarlet, green, and black girdles are worn on which, for officers, non-commissioned officers, trumpeters and gunners, the revolver, with a scarlet cord, is hung. The forage cap is dark green with a black band piped with scarlet. The greatcoat has black collar patches piped with scarlet. The dragoon sword is worn by all under commissioned rank, officers having slung swords with steel scabbards. In full dress, the Guards have copper shoulder-scales and dark green overalls with two scarlet stripes, the ordinary pantaloons for all batteries are blue-grey. A description of the materiel hardly enters into the *cadre* of the present study, although mention must be made of the horse artillery as they are so closely connected with the cavalry.

IV. PIONEER EQUIPMENT.

In consequence of the experience of the last war, this has now been introduced in Russia, and it has been decided, in order to save the horses, that they are not to be carried, unless exceptionally, by the men, but on pack saddles. Each squadron is, therefore, in future to be provided with a pack saddle, which fits on the ordinary saddle tree and consists of two wooden arches (fig. 1) joined together by wooden bars. At the bottom of each arch is a large hook to support the shovels and heavier tools, and about half way up on each are hooks to which are hung the boxes containing the dynamite slabs. A strap passing round the saddle secures everything. On the top, in a box fitted between the arches, are carried the small stores. On each saddle are carried :—

8 Shovels	1 Hatchet	8 Rolls of Bickford's fuze.
1 Crowbar	2 Boxes for slabs	1 Packet of twine.
1 Chisel	24 Cartouches for slabs	1 Spare rope for tools.
1 Maul	48 Dynamite slabs	8 Ropes for climbing
1 Augur	80 Detonators	telegraph poles.
	1 Roll of iron wire.	

and various smaller instruments (keys for unscrewing bolts, scissors, &c). The total weight of the saddle and its accessories is 37lbs, that of the implements carried 122½lbs, total 154½lbs. Dynamite is carried in a separate cart by the train and only issued when required, and the articles may also, when necessary, be carried by the men. In this case the crowbars or augurs are placed horizontally under the valise straps, the mauls or shovels are strapped to the belt with the handles fixed to the shoulder-straps, and the detonators or slabs may be carried in cases strapped to the valise. A certain number of officers and men are annually put through a course of pioneer duties, but no fixed number of pioneers is as yet laid down as in the Austrian and Italian armies.

V. SADDLERY.

The saddlery of the Russian cavalry is practical, not too heavy, and well, if a trifle roughly, made. It presents many peculiarities, such as the arrangement of the bit, the use of the horse blanket and numnahs, &c.

The bridle (fig. 2) consists of an ordinary bridle head with brow and nose bands and throat lash. It ends in two rings into which the bit is hooked, as shewn in the figure. The bit is prevented from falling out by the curb chain, by the spring of the hooks, and by the cross bars in the rings. A head-collar and T. bit are also worn as in our service.

On the horse's back are placed four square felt numnahs and over them a leather cover (fig. 3), with a shoe pocket (and smaller pocket for nails inside) on each side. These are united by strings which pass through all five and are fastened to the arches, thus leaving room for a free current of air along the back. The numnahs can be changed daily so as always to have a fresh one next the back. On the top of them is placed the saddle-tree (fig. 5) consisting of two wooden trees with Ds. for the strirrup leathers, connected by two wooden arches between which is stretched a leather seat, laced down to the trees on each side. To the trees are also fixed thongs for steadying the girths, of which there are two (fig 4), and the breast plate. To the front arch are fixed, by straps, the wallets (fig. 6) which draw together by strings at the top. On the saddle is placed the horse blanket of uncoloured wool lined with coarse linen, folded as in figs. 7 and 8, and steadied by the same thongs which pass through the girths. Over the whole is buckled the surcingle. Behind the saddle is placed the valise, made as in our service but smaller.

In the off wallet are carried a holdall, a piece of soap, a clothes brush, a blacking brush, a currycomb and a horse brush; in the near wallet a towel, a shirt, a pair of foot-cloths, and the salt and meal bags. The biscuit bag, made exactly the same as our corn bags, but smaller, is carried with an end stuffed into each wallet and the centre passing over the pummel. Across the wallets are also carried the cloak, the forage cap, the nose-bag, and a forage cord. In the valise are carried, in the off end, a shirt, a linen tunic, a cravat, a boot, a pair of foot-cloths, and a pair of gloves; in the near end, a pair of pantaloons, a pair of drawers, a boot, and a pair of foot-cloths.

The mess tin fits over one end of the valise. In the field or at manœuvres, the cornsack, the forage net, and a spare pair of boots, are placed on the top of the valise. Shabraques are only worn by the Guard on parade.

A cavalry horse in marching order presents a very rough and ready appearance to one accustomed to the English system, but private troopers have assured us that the saddle is very comfortable to ride in, and but few complaints are heard of the saddlery in the last war, except that iron arches might, with advantage, be substituted for wooden ones.

VI. HORSES.

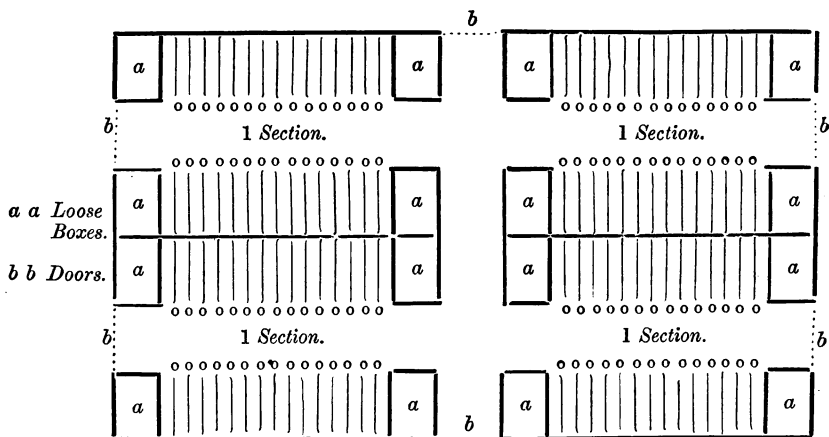
As a general rule the horses of the Russian cavalry are fine, strong limbed, and well shaped animals, with good action, but are most decidedly inferior, in the Line, to those of the English cavalry. In the Guard, the horses are quite equal, if not superior in the Cuirassiers, to ours, and great pains are taken to place horses of the same colour in the same regiment, and a further sub-division by squadrons, and even by sections, takes place. The colours of the Cuirassier horses we have already given. Those of the Horse Grenadiers are black; Dragoon Guards, bay; Guard Lancers, chesnut; Emperor's Lancers, brown; Guard Hussars, grey; Grodno Hussars, dark bay. In the line in each regiment the 1st squadron is light bay, 2nd black, 3rd chesnut, 4th dark bay or brown. Grey horses are not taken in the dragoons but in the other arms are ridden by all trumpeters. The officer's horses are mostly English, Arab, or Hungarian, and some in the Guard are truly magnificent animals. Remounts must be from 4 to 7 years old for the Guard, 4 to 6 for the Line, and be of the following sizes (measured a hand's breadth behind the saddle):—

- | | | | | |
|------------------------|----------|--------------------|------------------|---------|
| (a) Guards Cuirassiers | 15 hands | $1\frac{1}{2}$ in. | to 16 hands | 1 in. |
| (b) Other Guard Regts | 14 | " | $3\frac{1}{2}$ " | to 15 " |
| (c) Line Regiments | 14 | " | 3 " | to 15 " |

A horse is supposed to be serviceable for nine years, so that every year a cavalry regiment receives $\frac{1}{9}$ th of its strength as remounts—a better system than that of keeping horses till they are worn out. Not more than a third of the total strength may be mares. Each brigade has a remount officer who travels all over the country to buy horses and has a detachment of soldiers with him to conduct them to the reserve squadrons. For each horse bought, he receives for category (a) £45, (b) £28 to £30. 8. and (c) £18. 16. and for their journey to the reserve squadrons 12. in the Guard, 9. in the Line. The horses on arrival are passed by a board, and kept for a year with the reserve squadrons to be broken. Each year, after the manœuvres, the horses are put out to grass for a month, and after this the casting takes place, the cast horses being sold by auction.

The line cavalry are, in winter, mostly scattered by squadrons in the frontier villages, but the Guard Regiments have remarkably fine barracks. The stables are almost invariably separate from the

men's quarters, and are each made to contain a squadron, with a separate stable for each section as in the following figure.



The saddlery is kept in the stables on a shelf which runs about 6 feet from the ground all along the rear of the stalls. The bales and heel posts are of wood. The litter is kept outside on fine days, and straw mats are placed in rear of the stalls as with us. The shoes are much lighter than ours and have all calkins. Manes and tails are allowed to be much longer than in our service, and there is often a want of trimming at the heels observable.

VII. CHARACTERISTICS OF THE VARIOUS ARMS.

Many imagine and deplore the fact, that the English trooper rides the heaviest in Europe, but having seen a number of average Russian regiments, both Guards and Line, we are of opinion that the Russian hussar or lancer is as big a man and rides as heavy as the British medium dragoon, and the Cuirassiers heavier than our household cavalry. But England has no Cossacks. The Russian Cuirassiers, men picked for their fine appearance from an immense empire, form perhaps the finest body of men in Europe, and their appearance on parade, with their magnificent horses, burnished copper cuirasses and helmets, and lance flags waving over all, is splendid. Recruits for the Guard cavalry must be at least 5 feet 6 inches high, for the Cuirassiers only very tall men are taken. The Guard cavalry are very smart in their dress and approach more to the English "swagger" than any other troops on the continent, but the loose pantaloons worn by the entire Russian cavalry, except hussars, somewhat detract from their appearance. The recruits for the Line are chosen after those of the Guards, Horse Artillery and Engineers, and must be at least 5 feet 5 inches high (the average is about 5 feet 9 inches), and of good strong constitution and build. The men are rather slack in their dress and frequently even dirty, the hussars being generally the best turned out. The Russian

trooper rides well but with an awkward seat, the heel being drawn too much back, which has a tendency to throw the body forward. For riding we would give the palm to the lancers.

The Dragoons are a good deal lighter than the others and are intended more to act as mounted infantry, for which their dress and equipment suit admirably, and a characteristic of their drill is the absence of all noise and jingle, due to the leather scabbards and short hung swords. When dismounted, at a little distance, they may easily be mistaken for infantry, a delusion further kept up by their fixed bayonets. Frequently, at a review, the dragoons march past dismounted their led horses following them.

Lancers and Hussars are cavalry of the line, and, as such, are mounted on heavier horses than those of the dragoons. Both have a great similarity in appearance to German regiments of the same arms, but, contrary to all generally received notions, the hussars are the heavier of the two. Both are pre-eminently shock cavalry, and for this reason the front rank is armed with lances, the idea being that the rear rank men with their swords enlarge the gaps made by their front rank men in a charge and are at hand to disengage their comrades armed with the less handy weapon. The rear rank can also be used for dismounted fighting, but of them much less use is made (in theory) than of dragoons. Looking at the composition of the cavalry divisions, one cannot but be struck by the judicious combination of the various arms. For outpost work, reconnoitring, and scouting, (duties in which the regulars failed in 1877-8), we have the Cossacks; for the shock, Hussars and Lancers; and for the storming of detached posts, the holding of positions important to be maintained till the infantry come up, and the various duties so often required of cavalry under modern conditions of warfare, the Dragoons. Perhaps the predilection for dismounted fighting has grown too strong in the Russian cavalry, for in mounted duties their want of dash is often painfully evident to readers of Baker Pasha, Greene, or Cardinal von Widdern. How much the rifle was used in the last war is apparent from the officially published returns. From those it appears that the cavalry fired away 64 per. cent. of the total number of rounds carried for them in the pouches and in the ammunition columns, surely a very large proportion, seeing that for infantry the same figure is only 47.*

Finally, a word on the horse artillery. For turn out, riding, drill, and general appearance, these troops would bear comparison with any batteries on the continent of Europe. Their horses are well-bred, large, and strong, and the driving is as near perfection as can be attained with pole draught. The pace kept up over the roughest ground is admirable, and the horse's load is further lightened by the absence of gunners from the limber boxes. In line, and when marching past, the detachments invariably ride along side and on both flanks of their

* There are carried for infantry in the pouches, S. A. A. carts, and 1st line reserves, 172 rounds per man; for cavalry, on an average, 121 (Dragoons 127, Cossacks 151, others 87).

guns, the front rank in line with the wheel horses and the rear rank in line with the gun-wheels, the No. 1 riding in front of the team. The sponge is carried in a bucket fixed to the stirrup, like a lance, by one of the detachment. The equipment is excellent, as, wearing the dragoon sword, the gunners movements are unimpeded by a scabbard knocking about between their legs, and the possession of revolvers gives them a chance for their lives if attacked by cavalry suddenly.

VIII. TRAIN.

The Russian train waggons are very clumsy and heavy, and during the last war were perfectly unable to keep up with the regiments after their passage of the Danube, and soon went to pieces on the infamous roads. The light carts, bought by several regiments in Bessarabia previous to the war, on the contrary, accompanied the regiments to the end of the campaign. Besides the waggons enumerated above, we must mention the "artiel" waggons, a peculiar institution in the Russian Army. These are squadron carts, the private property of the troops, and carry the various items of food, &c., bought by the squadron messmen to supplement the rations. These succeeded in following the troops everywhere, and in an account of the defence of the Shipka by a field artillery officer, we read of the "artiel" waggon bringing up every day cooked rations, for the men under fire in the batteries, from the foot of the pass, the meat or soup being re-heated half-way up, so as to arrive hot in the battery. It is under consideration to replace the present 4-horse waggons by light 2-horsed carts and to strike out the treasury and archive waggons from the list.

IX. DRILL.

The drill of the Russian cavalry is almost an exact copy of that of the Germans, the same clever use of column and half column being made. This drill, being well known to British officers through several recent military publications, it is needless to advert to it here, and only a few notes on the formation of the squadron and the dismounted drill need be given.

Each squadron is divided into 4 sections (plutongi), each of 16 files with one non-commissioned officer on each flank of each rank. The men are placed stirrup to stirrup, each file being supposed to occupy a pace (1 arshin or $27\frac{1}{2}$ inches). The rear rank is one pace from the front rank from nose to croup. The officers commanding sections are one pace in front of the centre of their command, the squadron-leaders one pace in front of the centre of the line of officers, on parade. A horses length is considered as three paces. The interval between squadrons in the same regiment is equal to the front of a section, and that between two regiments in the same brigade, to the front of two sections. All movements are by threes, as in Germany, and in column of route by threes; there is no distance allowed between front and rear ranks, in fact, their horses overlap. The rates of movement are much slower than with us, and *a fortiori* than with the Germans, the walk being only $95\frac{1}{2}$ yards per minute, trot 231, and gallop $307\frac{1}{2}$ yards. In

attacks, "trot" is sounded at 1000 paces, "gallop" at 3-400 and "charge, hurrah!" at 150. A peculiar feature of the Russian cavalry is the large number of special scouts in the ranks. In each section the four most intelligent men are picked out as "Naiezdniki," or scouts, and posted usually on the flanks of each rank. Previous to a charge they are ordered out to reconnoitre the ground and prevent the occurrence of such catastrophes as overtook the Prussian 4th Hussars and 2nd Dragoons at Königgrätz. Besides these there are in each squadron 6 "Dozori," or patrollers, which are used when the squadron is working independently, as flank and advanced patrols.

A squadron bivouacs in line, the horses heads being turned inwards and the saddlery placed between the two ranks, the men lying behind their horses. A regiment bivouacs in column of squadrons with the officers on the flanks.

Cavalry outposts, as a general rule, are formed in four lines. The picquets (4 men each) are placed from 300 to 400 paces apart and throw out double vedettes or single sentries (as necessary) to their front. The supports (8 to 12 men each) are 1000 paces behind the picquets, and the main body (two-thirds of the whole force) is 1500 paces behind the supports. A squadron is calculated to watch from 3 to 4000 paces of front according to the nature of the country.

For foot-fighting no new numbering off is required.* When "dismount" is ordered (we speak now of Dragoons only), the front rank advances and the rear rank retires half a horse's length. The Nos. 1 and 3 then dismount, 3 on the near, 1 on the off side. The right flank non-commissioned officers remain mounted and hold officers' horses, &c., those of the left flank dismount. In each squadron, division, or regiment which has dismounted its men, an officer is told off to command the *Konovodi* or horse-holders, and his duties are to keep the horses as near the fighting line as is consistent with their being properly under cover, and all trumpet-calls for the horse-holders are preceded by a special call. Squadron, division, and regimental commanders always remain mounted. Each group of two files forms a "swarm" for fighting, and are known as "fighting comrades," and commanded by the most intelligent soldier. On dismounting, the men of each squadron fix bayonets and invariably fall in in column of sections, two sections distance in front of their squadron. The squadron-leader retains two men as orderlies with him. A reserve is always retained to cover the retreat of the men to their horses if necessary, and is kept within 150 paces of the fighting line. On foot, the drill is exactly similar to that of the infantry, the squadron being considered as a company.

Lancers and Hussars may also be employed in dismounted fighting. In this case the front rank men hold the horses of the rear rank, but, the men having no bayonets and not being suitably equipped, and

* N. B.—A wise and practical exception to the general copying of German regulations. In that service the men tell off by twos and the even numbers dismount.

besides a squadron being only able to place half of its men in the fighting line, while Dragoons place two-thirds, these troops are never dismounted when dragoons are available.

X. DON COSSACKS.

The general principles of Cossack organization are that the men are the proprietors of the soil they cultivate, that they have their own social autonomy, and that they pay no taxes, but in return are subjected to universal military service, equipping and mounting themselves at their own expense, Government finding arms only. The Cossacks are divided into three classes—

(a). The "Preparatory Class," to which all the men belong from 18 to 21 years of age and are styled "malolietki." In this class elementary drills are taught, which are easily learned, as all the games even of Cossack children have a distinctly military tendency, such as riding, lance exercise, &c.

(b). The "Active Class," of men from 21 to 33 years of age. The men are divided into three categories. In the first four years of service this class fills the ranks of the active regiments. After this they are sent on furlough, but have to keep horses and equipment ready for war for the next four years, and on war breaking out those men form the 2nd category regiments (21 to 40). For the last four years they are not required to keep horses but must have their equipment ready and may be called up for periodical training.

(c). The last, or "Reserve Class," of men from 33 to 38 years of age, cannot be called out in peace and correspond somewhat to the Russian "opoltschenie" or militia.

Absence from number-parade or periodical training is punished by a heavy fine, and those go to augment the Don Military Chest out of which most liberal allowances are made for the families of Cossacks killed on service. Exemptions from service are granted (1) if a man is the only bread-winner of the family, (2) if several males of the family have already served in the same year, (3) if more than two members of a family are already in activity, (4) if within two years a man's house has been burned (a by no means uncommon event on the Don), (5) if within a year a man's crops have been destroyed, and (6) if men are utterly without means through no fault of their own.

Cossacks who have passed through the higher government schools and intend to follow a profession, may enter the service at 17 years of age and choose their own regiment, and their active service is reduced to 6 months, 1 year, 2 years or 3 years, according to the degree of the examination they have passed. Those men frequently become officers or non-commissioned officers of the reserve. The clergy and church singers are exempted from all service.

The War Minister fixes the strength of the annual contingent, and then lots are drawn, the highest numbers being taken to form the quota of each "stanitsa" or parish. The parish authorities decide upon cases of exemption, &c. ; severe punishments are laid down for

those who fail to appear for conscription, but this crime is very rare, thanks to the excellent spirit which animates the Cossacks.

The total number of troops furnished by the Don Cossack Army is:—

<i>Peace.</i>	<i>War.</i>
Guard—2 divisions of 2 squadrons. 1 battery of 4 guns.	2 regiments of 6 squadrons. 1 battery of 6 guns.
Line—20 regiments of 6 sotni. 7 batteries of 6 guns.	60 regiments of 6 sotni. 21 batteries of 6 guns.

In addition to the above there are seven permanent local detachments in various towns of the Don territory comprising in all 46 officers, 66 non-commissioned officers, 7 trumpeters, 6 officials, 1020 combatants and 119 non-combatants. The regiments are numbered from 1 to 60, the 1st to 20th being formed of men of the 1st category, 21st to 40th of the 2nd, and 41st to 60th of the 3rd. During the last war the 2nd category regiments and batteries* were called out for service, but we are not aware of regiments of the 3rd category having been embodied, at least no mention is made of them in any history of the war we have seen. For the furloughed regiments, no cadres are kept up, those being given to them by the active regiments, which, for this purpose, have 32 officers in peace and only 21 in war. Each battery has in peace a cadre of 3 officers and 20 draught horses, and 4 non-commissioned officers, 111 soldiers, and 35 riding horses are kept up in the Don Territory for the care of the materiel, &c.

The names of the various ranks in the Cossacks are quite different from those in the regular army viz:—

Captain—Esaoöl.
Lieutenant—Sotnik.
Sub-Lieutenant—Koroonji.
Non-Commissioned Officer—Ooriadnik.
Lance Corporal—Prikaznii.

In appearance the Cossacks are fine well-made men, but their custom of wearing their hair very long and cut square on the nape of the neck gives them a most unsoldierlike look. Their uniform is very simple, consisting of a dark blue tunic (tchekmen) without any facings or piping, rather long in the skirts, and with the regimental number in scarlet letters on the shoulder-straps, dark blue loose pantaloons with broad scarlet stripes, and long boots up to the knees without spurs. The shacos are perfectly cylindrical and provided with semi-circular peaks. They are made of black leather, without any ornament, and are worn cocked over the right ear, quite as much as our forage caps. The undress cap is dark blue with a red band, and the greatcoat and hood are the same as those of the regular army. The equipment is composed of a black waist belt, to which the sword

* The artillery have no 3rd Category. All furloughed batteries belong to the 2nd.

is suspended, as in the dragoons, and the Cossack whip (*nagaika*) similar to those of English Artillery drivers but with a stouter lash. The arms are lance, sword (*shashka*) and rifle. The former has no flag and the stave is painted black. The sword is very much curved, has no guard, a brass mounted hilt, and is carried in a black leather scabbard. The rifles are carried in cases as in the regular cavalry. The Guard Cossacks have entirely scarlet uniforms with hussar braid and fur busbies, and are distinguished from the line by wearing spurs.

The saddlery of the Cossacks is very similar to that of the line cavalry, but, instead of the horse-blanket, they have an enormously thick padded leather cushion which raises the man at least six inches from the horse's back, and very high pummels and cantles. The horses are ridden only with snaffles. The men's seats are most ungraceful. The knees are tucked up under the wallets and the heels drawn back almost on a level with the horse's belly. The horses are mere ponies with rough and shaggy coats, manes, and tails. They are mostly of Cossack or Khirgiz breed and have most marvellous powers of endurance, as exemplified in the forced march to Barboshi, both crossings of the Balkans, and many other operations in the late war. They are very badly shod indeed, no attention being paid to the care of the foot, thus thrush and other foot diseases are of frequent occurrence. The grooming is detestable and the stables far from savoury.

A word must be said for the Cossack Horse Artillery than whom there are no smarter troops in the army of the Czar. Dressed much the same as the regulars, but wearing the Cossacks' shako, they are very much superior to the Don Cavalry Regiments. Well horsed, excellently drilled, smartly turned out, and moving at a faster pace than most artillerymen deem safe, and with a total disregard of that apple of an English Gunner's eye, his horses' "bellies," the Cossack Artillery are well calculated to please a soldier's eye.

In the drill of the Cavalry Regiments, there is one feature not to be observed in the regulars. This is the "lava," or attack in skirmishing order, which is executed at a great pace and with wild yells of "hourra." The "lava" is even practised against cavalry in close order—surely a mistake—however effectual it may be against infantry or guns. The Cossack outpost system differs from that of the regulars in having only three lines, the "Beketi" or videttes of four men (furnishing two sentries), placed 1000 to 1500 paces apart on open ground, the "Zastani" or supports of 4 to 12 men, very few in number, and posted at cross-roads, &c., and a reserve. A sotnia can watch 4000 to 6000 paces of front. It is thus more economical to use Cossacks than regulars for outpost duty, and when the two are employed together the latter invariably form the reserve.

A big, fine man, mounted on a pony, with his body bent forward and looking very top-heavy, always at a gallop and waving his enormous whip, the Cossack presents an almost ludicrous appearance to one accustomed to our stately troopers. But this feeling is dashed with a regret that we possess no such soldiers. Cheerful under most adverse

circumstances, obedient to orders, and devoted to his sovereign, the Cossack is the ideal of a soldier, and well educated, accustomed from his youth to riding, to the management of arms, and to finding his way in thinly populated districts, he is far from a bad light cavalryman.

NOTE.—Figures 1 to 8, were copied by permission, from Editor of “Revue Militaire de l'Etranger.”—

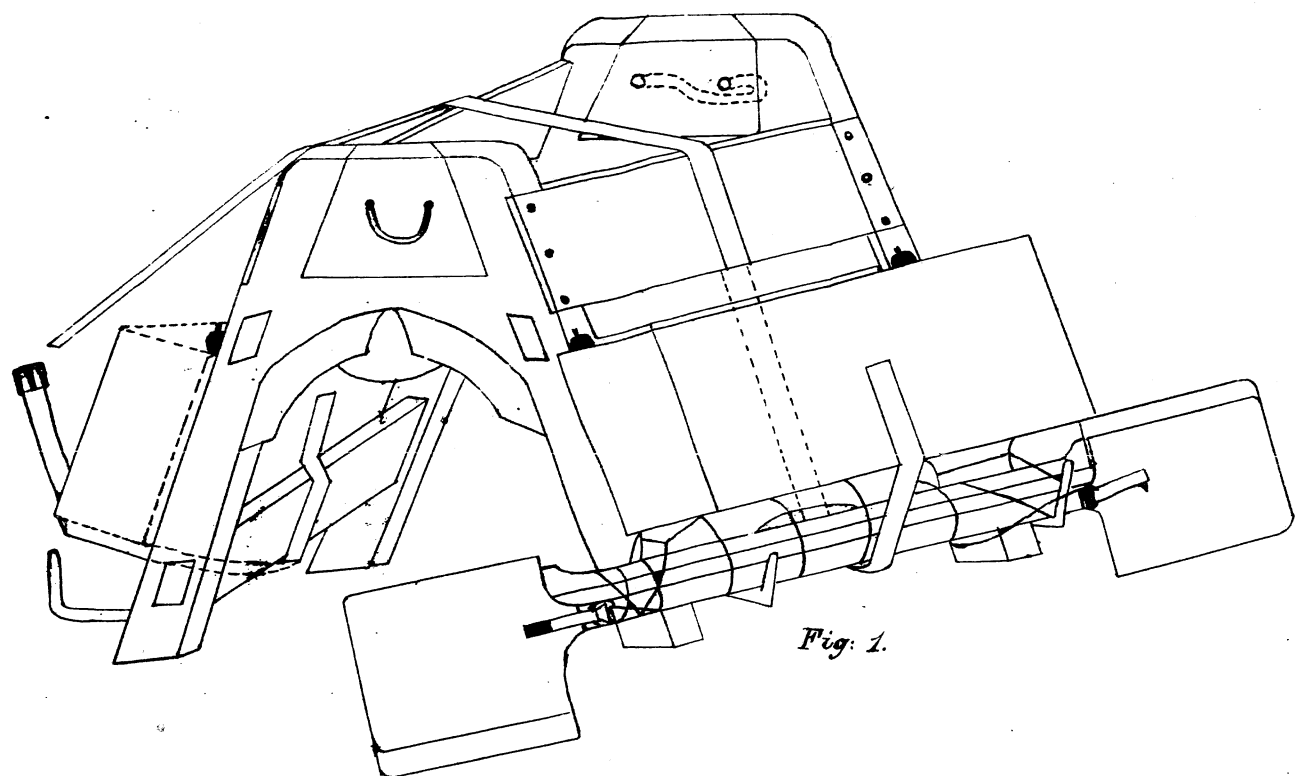


Fig. 1.



Fig. 6.

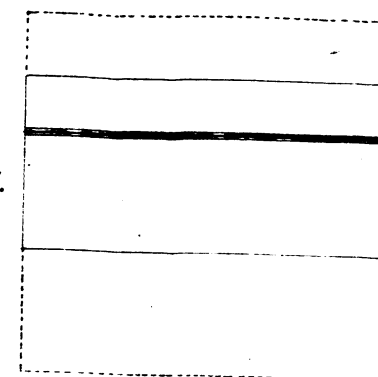


Fig. 7.

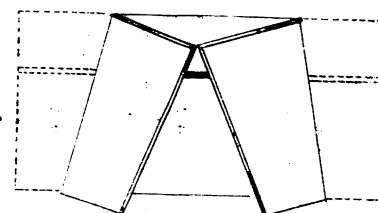


Fig. 8.

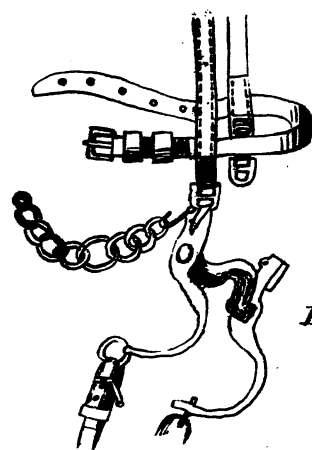


Fig. 2.

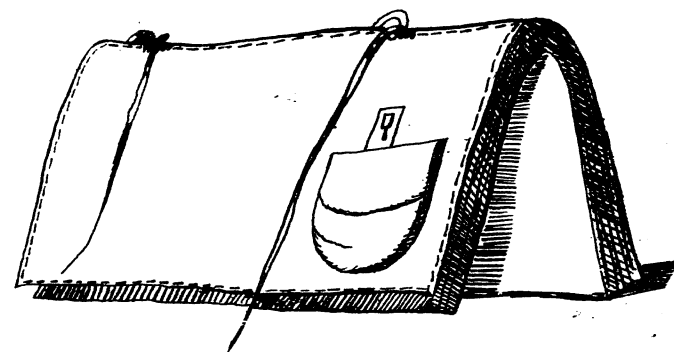


Fig. 3.

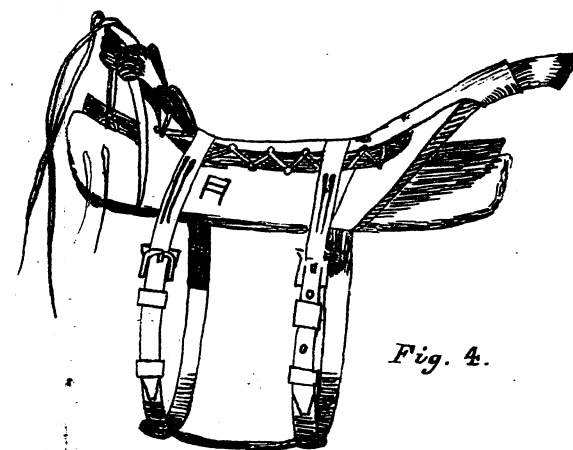


Fig. 4.

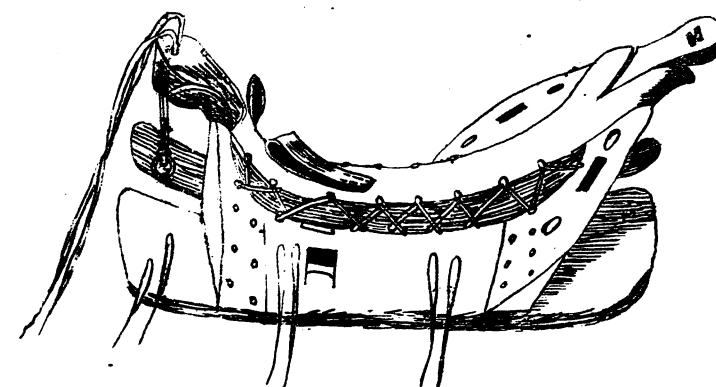


Fig. 5.

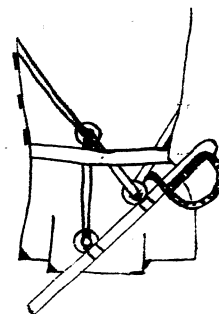


Fig. 9.

III. RANGE FINDERS AND LONG RANGE RIFLE SIGHTS.

BY
MAJOR HOLMES.

INTRODUCTION.

It was established at the siege of Plevna that the Martini Henri rifle can send a bullet 3000 yards, more or less, with deadly effect. Before this, it was not considered necessary to sight a military rifle beyond 1500 yards, and judging distance by eye was not taught further; since then the necessity has been recognised for sighting rifles to longer ranges, and various inventors have invented Range Finders.

The present "top sight" principle of sighting rifles is practically inefficient over 800 yards, and the Stadiometer, till quite recently the only Infantry Range Finder, is obviously unfit for real service, as it must be taken away to the enemy's end of the range to be used.

In short, to utilise the new found powers of the rifle, it is necessary to adopt new methods of sighting rifles, and judging distance, the former not to supersede the present method but auxiliary to it.

Many officers of experience doubt the necessity of teaching soldiers to use aimed fire even up to the distances for which their rifles are nominally sighted at present, and consider more useful results would be obtained by teaching them to make sure of an enemy at 200 yards.

There is no doubt that this capability, at present said to be non-existent in our army, would often prove useful, not only in its direct application, but also as a deterrent to any enemy prompt to try conclusions at close quarters.

Giving due weight to these opinions, there is still no reason why rifles should not be sighted so that trained marksmen could use them up to their maximum effective range, provided always, that this could be done without spoiling them for use at the shorter ranges, and also that means exist for ascertaining ranges with rapidity and accuracy, for without an effective range finder, long range sights are obviously useless.

One might safely go further and maintain that, subject to these conditions, long range sights and range finders are a most necessary part of Infantry equipment, and the best articles of the kind that can be obtained for love or money, should be at once introduced into our service.

I have given much thought and expended some money in trying to devise these instruments of patterns suitable for service requirements. With the rifle sights, I fortunately commenced by a "Happy Thought" which I forthwith caused to be patented, and hope to see, ere long, very long range rifle sights in general use in our service, as I have reason to believe their suitability has been practically recognised.

With the Range Finder, I unfortunately commenced "inventing" before I had studied the subject in all its bearings, the result being theoretical success, but practical failure, and a great waste of thought and money. But I think I know more about the subject now. I only mention these personal experiences as my justification (small though it be) for venturing to hold forth on these subjects before so distinguished an audience.

I propose leaving the sights to the last, and commencing with the Range Finders.

A "Range Finder" is an instrument for judging the range or distance of an enemy on whom you wish to open fire.

It may be defined as a surveying instrument for finding the length of one long side of a very "ill-conditioned" triangle, the accessible elements of which are, a disproportionately short base and its two adjacent angles.

I may here remark that an equilateral triangle is the trigonometrical surveyor's "beau ideal" of a well conditioned triangle. I will letter the diagram (Fig: 1) representing this disagreeable triangle we have to deal with, A. X. B. and keep to the same lettering throughout the lecture.

In the triangle AXB.

$AB = b$ the base.

A and B the angles adjacent to b .

$AX = x$ the Range.

or $BX = y$ "

All that has to be done with the Range Finder is:—

Problem. Given A, B and b to find x .

Uncommonly simple this looks, but when you hear what are (at least in my opinion), the requirements of a suitable Infantry Range Finder, you will think that, after all, it is not such a very easy instrument to invent.

I must ask you now to take for granted that one Range Finder at each end of the base, with a firm tripod stand, is absolutely necessary. The term "Range Finder," includes all the adjuncts of the instrument, one of which must be a reliable telescope.

Conditions of fitness for an Infantry Range Finder.

1st. Portability.—That means, when packed for transport, it must be very light and compact, and capable of standing rough usage without sustaining damage.

2nd. Unpacking and setting it up for use must be a simple and nearly instantaneous process on any ground rough or smooth, and, therefore, necessarily, a Range Finder must not consist of a number of pieces requiring to be put together, neither should the adjuncts, to be used separately, be many in number.

3rd. After the Range Finders are set up; to find X with them must be a simple, and, as near as may be, instantaneous act, not necessitating any particular delicacy of manipulation, education of the eye, or possession of mathematical knowledge.

4th. The readings of the observations must never be ambiguous, that is, capable of giving one or more results besides the correct one.

5th. The instruments that take the angles must also be able to measure "*b*" automatically.

6th. The "limb," that is to say, the graduated arc or line on which the angular measurements of A or B are recorded, should be so arranged that the smallest increase or decrease in *x*, required to be measured for range finding purposes, is recorded by one or more divisions on the "limb," easily perceptible to the naked eye unassisted by verniers or microscopes.

7th. The instrument must be very strong and of simple mechanism, not easily put out of, and constantly requiring, adjustment, though capable of itself indicating unmistakeably, when it is out of adjustment, and, at the same time, capable of being re-adjusted accurately when this is found necessary.

8th. There should be, if possible, only one, certainly not more than two, tangent screws with each instrument, the accompanying clamps being self acting.

9th. It must not be necessary to set up the tripod precisely over any part on the ground, that is to say, if a shot is required from A or B, it must be possible to do this exactly, not approximately, by setting the tripod down within a foot or so of the point A or B; the necessity for this is, to obviate the tedious delay caused by having to place a tripod on rough ground so that its plummet exactly coincides with a given point on the ground.

10th. All observations must be referred to the horizontal plane, whatever the difference may be in height above sea level between the points A, B and X.

11th. The "Calculator" should only be required to multiply or divide one number by another, and this should be the only arithmetical operation necessary.

12th. A range finding squad should not exceed 3 men, one for each instrument, and one to check both shots; more men would get in each other's way and attract the enemy's fire.

In the above list of requirements some practical essential may have been omitted; a captious critic might say, on the other hand, that an instrument fulfilling all these conditions only required speech to be perfection, and that they are a parcel of inconsistent impossibilities. But the trigonometrical definition of Range Finding I started with, if accepted as correct, makes it an extremely difficult problem. All the same, I think, it is not quite out of the region of possibilities to devise an instrument that would go very nearly fulfilling them. Let Government offer £ 10,000 to the inventor who produces a Range Finder to fulfil all the requirements I have sketched, and I think, before very long, Government would get an instrument that would answer the purpose. At present, as far as I know, the "Committee on Range Finders" has not issued any set of conditions that a Range Finder must fulfil before it can be accepted. It would be an excellent idea if

they did issue such a document and this would save much anguish of mind to ingenious but unpractical men in search of this "Will of the Wisp"—an efficient Range Finder.

The root of the difficulty of Range Finding is clearly the necessity for having a disproportionately short base to the triangle A X B. The reasons for this necessity are:—

1st. You cannot pick and choose your X; you must take any object that offers itself nearest your enemy, but still it is necessary that the observers from A and B both shoot the same X and the same point of it. And to ensure this, when X is not a very conspicuous object, both shots must be tested by one man who cannot get from one end of the base to the other quickly enough unless it is a very short base.

2nd. To measure a long base you require a chain, for tapes and twine stretch and break, and the chain adds weight and parts to your Range Finder, whereas a short base can be accurately measured by the instrument that takes the angles by well known methods explained in "Heather," and other treatises on surveying instruments.

I propose now discussing briefly the Range Finders invented up to date as well as my limited opportunities of studying them enables me to do; these are:—

1. Nolan's (Artillery) Range Finder.
2. Watkin's Infantry do.
3. Weldon's " "
4. Holmes' " "
5. Roberts' " "

1. NOLAN'S RANGE FINDER.

Nolan arranges his triangle A X B so that a perpendicular from X on the base shall fall on it between the points A and B and $(A + B)$ or the sum of the base angles must not exceed $179\frac{1}{2}^\circ$ or be less than 175° . The formula he uses is $X = \left(\frac{b}{\sin A + B} \right)$, an approximation arrived at as follows:—

By plane trigonometry $x = \frac{b \sin B}{\sin X}$ and therefore B differing very little from 90° , ($\sin B = 1$) is a close approximation, and he therefore assumes unity as the value of $\sin B$. We know that $\sin X = \sin (A + B)$. Substituting these values in the trigonometrical equation we get $X = \frac{b}{\sin (A + B)}$ or Nolan's approximation.

In Nolan's Hand book for Field Range Finder Mark I, the instruments of which the Range Finder consists are clearly described.

(See Appendix I, and Nolan's Hand book page 3, &c.) Its working and principle are briefly as follows:—Suppose the annexed diagram (Fig: 2) to represent the base end of our old triangle AXB enlarged, and suppose the two instruments set up at A and B; the main telescopes being directed on the distant point X, the pivoting points of the smaller cross telescopes coinciding with the points A and B.

The precise angles at which these cross telescopes are at first placed is immaterial, but for convenience their vernier bearing arms should coincide nearly with the direction of the big telescope making the

small telescope nearly at right angles to the latter. The cross telescopes are now, by means of the tangent screws, directed each at the big end of the other so as to have the axes or lines of sight in the same straight line A B or *b*. Their arms will of course then be parallel to each other, and their verniers indicate $(90^\circ - A)$ and $(90^\circ - B)$ respectively, because O1 and O2, the true zeros of the graduated arcs, are immediately over the visual axes of their respective telescopes. The sine of the sum of these recorded angles is, $\sin \left\{ 180^\circ - (A + B) \right\} = \sin (A + B)$.

In the meanwhile the base "*b*" has been measured by a tape and all that is now necessary is to refer the two ascertained data to the calculating disc which works out mechanically the division of *b* by $\sin (A + B)$.

The cross telescope vernier arms are each 1 foot in length giving an arc $\frac{2}{10}$ ths of an inch on the limb for each degree of angle. The limb is not graduated into degrees and minutes as in a theodolite, but the proper length of an arc for $2\frac{1}{2}^\circ$ is subdivided into 10 equal parts, each of these being further subdivided 10 times by the vernier. With Nolan's Range Finder angular differences of $1'30''$ can be easily read.

Under ordinary circumstances two instruments and a tape are available, but by special contrivances, which would take up too much time to describe, a Range can be found with only one instrument with or without the tape.

If judged by the "conditions of fitness," Nolan's Range Finder may be reported on as follows.

1. When packed for transport (without a tripod) it weighs over 30lbs, and is, therefore, disqualified as an Infantry Range Finder, but being mounted on, and carried with a field piece, its weight does not much matter for an Artillery Range Finder, and it seems capable of standing rough treatment when packed fairly well.

2 and 3—It fairly satisfies No. 2 condition, and also No. 3, except that working the calculator with its 7 scales, rapidly and efficiently, must require considerable practice and be rather confusing to any person not well acquainted with the mysteries of the "slide rule."

4. It fails to satisfy this condition.

5. Practically it fails with this condition also.

6. It satisfies 6 fairly well, but at the expense of lightness.

7, 8 and 9. It satisfies these three.

10. Here it fails.

11. Except the necessity of adding the angles A and B together it satisfies No. 11.

12. No. 12 is hardly applicable to it.

The inherent sources of error in this instrument are, 1st, the angular measurements not being always taken in the horizontal plane; 2nd, the approximation used in taking $\sin B = 1$; 3rd, the cross telescopes are not really directed on each others big ends, but on the ends of the opposite telescope protectors, which are fixed at right angles to the big telescopes, and, therefore, the cross telescopes are never exactly in the line A B.

It is for mathematicians to say how far these sources of error are mutually compensating or aggravating, and to what extent they are likely to affect the accuracy of the instrument.

WATKINS' RANGE FINDER.

The description of this instrument given in the hand book explain clearly its theory and working—(See Appendix II, and Watkins' Hand book page 3, etc).

The principle on which it is based is "double reflection," as in the sextant which, in my humble opinion, is fatal to it as a good Range Finder.

The objection to the sextant, as a surveying instrument, where extreme accuracy is required, are well set forth in Jackson's Military Surveying. (*Vide Edition 1853 page 83, and 89 and 98.*)

It is here stated that "three or four degrees either way can never affect an angle, so as to be of much consequence in military sketching;" the inference being that such an error is not unlikely to occur with a pocket sextant, but with such short bases as we are restricted to in range finding, so great an angular error would cause a miscalculation of hundreds of yards in the resultant range. Again, Colonel Jackson states that in measuring angles, not in the same horizontal plane, with the sextant, he has found the error greater than when he used a prismatic compass with the stand, and that he prefers the latter for general surveying purposes. Colonel Jackson knew well what he wrote about in this book, and the pocket sextant and prismatic compass of to-day are probably much the same as those of his day.

The sextant, if the reflected object is less than a quarter of a mile away, is subject to parallax, a source of error that must affect its accuracy appreciably, when the reflected object is only a few yards distant from the observer as in the case with Watkins' Range Finder.

With this instrument it is necessary theoretically, twice in each observation, to hold it vertically over a point on the ground, and being held in the hand, without a plummet even, this cannot be done with any great accuracy.

There is a peculiarity in the arrangement for adjusting this instrument that seems to me a probable source of error. In the ordinary sextant the horizon glass is practically a fixture and never moved or played any tricks with, except the instrument be found out of adjustment when this glass is moved into correct adjustment and then left alone; but in Watkins' Range Finder it has to be moved from its normal position $\frac{1}{8}$ th of a circle to be tested for accuracy, and then moved back again into its working position, and there seems no way of testing its adjustment when in this position.

To explain briefly the theory of the instrument.

Let B (Fig:3) be the initial point of observation, marked by a picket on the ground, and X the distant object; join B X bisecting it in O; describe a circle B A X. with centre O, and radius O X or O B.

An observer, any where out of the circle at A, if he walks towards x with Watkins' Range Finder to his eye at 90° will see the reflected

image of B when he gets on to the circumference of the circle B A X at the point A which fixes the other end of the base b . In the meanwhile a supplementary base B C, 6 yards long, is set off at right angles to A B, by eye, and the point C marked by a picket, and then the instrument from A, by help of this subsidiary base, gives the length of the base b . A final observation at B of that angle (the instrument having in the meanwhile been set to the base b) causes the range x to be recorded automatically on the spiral scale engraved round the cylinder. The spiral scale is graduated to show differences of x sufficiently small for Range Finding purposes, but with a short base, and a long range, the probable error of an observation would, I am inclined to think, be in excess of these differences, and, therefore, this power of reading x to small differences is thrown away. A parallel instance would be applying a diagonal scale to a rough military sketch to measure distances on it in feet when the yards themselves were rather doubtful approximations.

Watkins' Range Finder is obviously not capable of being tested by the standards of efficiency I have proposed for a Range Finder.

It would be well here to remark on an apparent inconsistency connected with the sextant. We all know that with Hadley's sextant, astronomical observations are made by sailors, on the accuracy of which depend every day the lives of thousands on the wide seas, and yet it is an instrument on the same principle, which I say is not good enough to determine a range of a few hundred yards on the land; but the paradox is of course only apparent.

In an astronomical observation with the sextant the plane of observation in quite a matter of indifference and the images brought into contact are so beautifully sharp and definite that no mistake as to their coincidence can occur; but even with these advantages, a Hadley's sextant requires considerable practice before it can be used with dexterity.

Compare the coincidence of a bright star with the limb of the moon, and the coincidence of one tree amongst many others, 3000 yards distant on a hill with a picket 50 yards away down a Khud, and you will realise the difference. No doubt the difficulty can be overcome, to a certain extent, by considerable practice and personal skill with the instrument, but that is just what a Range Finder should not require. Even given the skill, it is thrown away if the ground is not tolerably level.

With a Hadley's sextant on a tripod stand with the limb graduated as in Nolan's Range Finder, for convenience of reference to a mechanical calculator, perhaps good results might be obtained in level places, but, I feel convinced, that no smaller double reflecting instrument to measure angles, especially if it be held in the hand, can ever give results sufficiently reliable for general range finding purposes.

When this paper is published in the United Service Institution Journal there will be Appendices (II, III, IV) giving more detailed particulars of the working of the instrument and the theory on which its two scales are constructed, but I refrain from reading these now as I fear

it would be found too full of dry technical and mathematical details. I will only say now that there seem to me to be not less than five sources of error inherent in the principle of this instrument.

(1) The base scale to which the instrument is set is only graduated approximately; (2) the range scale on which " x " is read off, must, I think, depend on another approximation; (3) the two arms of the instrument are set in motion by the steel point of a screw pressing at right angles against a steel plate along the face of which it is supposed to glide, but into which, as a matter of fact, it bores a hole as you may see in this instrument I have with me, causing a false movement of the point of the screw; (4) the instrument being held in the hand without a plummet its true vertical position over a point on the ground cannot be ensured.

THE WELDON RANGE FINDER.

The theory and working of this instrument were fully described at a recent meeting of this Institute, and my knowledge of the instrument is principally derived from the report of the lecture on it, on that occasion, published in the newspapers.

The instrument proper is a simple prism constructed to reflect an angle of $88^{\circ}34'2''.85$; by means of this prism the two base angles of the ground triangle are made equal to the angle above mentioned, and consequently the base " b " is the variable quantity from the measurement of which is found the range x . The angle selected makes the sides x and y of the isosceles triangle each 20 times the base; so all that is necessary to find x is to set your triangle off on the ground, measure the base, and multiply it by 20.

Until he can get a sufficient number of his prisms made, the inventor proposes using as a substitute an instrument with two mirrors inclined to each other at half the required angle, their reflecting surfaces of course inwards. It follows from a well known principle of optics that if two objects, one seen by reflection in this instrument and the other by direct vision, appear to coincide, they will subtend an angle at the observers eye of twice the angle of inclination of the mirrors.

I have by me an instrument on this identical principle (issued some years ago from the Mathematical Instrument Department in Calcutta) intended for taking offsets, the mirrors being inclined to each other at 45° or half 90° . This instrument, which I am informed was invented also by Major Weldon eleven years ago, has been, I believe, in use for years amongst native subordinates of the Survey Department, and is found very serviceable for short offsets, not more than two or three chains in length, (beyond which distance it is not allowed to be used in Government surveys.)

In respect to portability and simplicity of mechanism, Weldon's Range Finder is not to be surpassed. It will go into ones waistcoat pocket, and there is no mechanism about it whatever; but for long ranges, I fear, the base becomes too long for practical Range Finding purposes. With any reflecting surveying instrument, if the observer is

at all tired and blown, his observations are certain to be affected considerably by "personal error," and the ground triangle used in Weldon's is such that a small error is likely to lead to great miscalculation of the range.

The Weldon instrument is constructed to set off an angle measured to 100th of a second—an extreme accuracy not attempted in the most elaborate and expensive theodolite—but the inventor does not seem to take into account the sources of error certain to arise owing to which a mistake of 2 or 3 degrees in the observed angles is not at all unlikely to occur.

1st. Unless taken on a perfectly horizontal plane the observations require correction as they will necessarily have been taken in some other plane.

2nd. The distant object is not seen direct but by reflection. A pole stuck in the ground being observed by direct vision, I presume the head of the pole is the point observed, the perpendicularity of the pole being guessed at, which can only be done approximately. On hilly ground, where the heights above the sea level of the points A, B and X differ appreciably, the pole should, *properly speaking*, be stuck in the ground at right angles to the plane through these objects, but that of course it is hopeless to attempt.

3rd. If we allow the possibility of an error of observation with this prism (ground to give an angle to the 100th part of a second), the instrument being held in the hand, without even a plummet and line to ensure its being vertically over any point on the ground, I think the following example will illustrate a source of serious error due to the system of an isosceles triangle with a variable base.

Taking the old triangle A X B, describe around it the circle A B B₁ X (Fig: 4).

Let us suppose the first shot with the prism is taken at a point A, the correct angle being X A D.

An error of observation is made making the angle X A D₁, instead of X A D.

The observer makes no error the second time but walks along A D, (having first set up his pole nicely at D₁) till he sees the reflection of X; he, of course, assumes A B₁ is his base, measures it and multiplies by 20 getting a very erroneous result. The point B₁ is obviously the point where the line A D₁ cuts the circumference of the circle of which A X B is the inscribed triangle. And there are an infinity of such points in the arc A B B₁, X, of the segment of this circle, on the chord A X. If we judge of the error in the base by the arc B B₁ it is obvious that in a very flat circle (to use familiar language), namely a circle with a large radius, B B₁ will be of appreciable length even when the angular error of observation at A is small. In Weldon's triangle this radius is about ten times the base *b* and, therefore, the miscalculation due to any angular error B A B₁, varies directly as the range.

4th. The pocket sextant, unless the objects seen by reflection are most distinct and unmistakeable, is an instrument most trying and

tiring to the eye; and the same remark must apply to Weldon's prism. In the prism you get a tiny representation of a frontage of 100 yards, more or less, of the distant landscape, and out of this picture you have to select a particular point of some object and make it coincide with the head of a pole you are looking at direct.

The picture I have drawn on the blackboard (Fig: 5) will give you some idea of the result, if you bear in mind that the prism picture is bobbing up and down more or less.

It may be possible by constant training to get a man to overcome this difficulty, but I doubt it. I imagine that after a short series of observations of this nature, (say amongst pine clad hills, all of the same pattern, without any very distinctive features) there would be a tendency on the part of the observer (especially if it was necessary to be very quick over the observation) to take a mean, as it were, and be satisfied with bringing the reflection of the neighbourhood generally of the point X over the head of the pole instead of the precise point X.

Weldon silvers the back of his prism, but why, I cannot understand, as no reflection, it is said, is so perfect as the internal reflection of a prism, when the reflected ray of light falls on it in the proper direction; but no doubt he has adopted this plan of silvering for some good optical reason.

Briefly it may be said of Weldon's Range Finder that it is not adapted for accurately finding a range, but a person well practised in its use could judge distance with it much more correctly than any one could with the unassisted eye.

I daresay it is more accurate than one of Watkins' Instruments that has been in constant use for any time, and it has the great merit of extreme lightness and simple construction. I am inclined, however, to the opinion that Lieut. Savage's method, described hereafter, would give equally good results with a fixed base of 50 yards. Take it all and all Weldon's is at present the best Infantry Range Finder known, and, as such, will no doubt establish itself on a satisfactory footing till something better is discovered.

HOLMES' INFANTRY RANGE FINDER.

The trigonometrical theory of this instrument is as follows:—

Reverting to our old friend A X B (Fig: 6).

At any point A in A X, set off the right angle X A B, on A B; measure a base b ; at B set off B C at right angles to X B cutting A X produced in C, then $x = \frac{b^2}{a}$; given a calculating machine to perform the operations of squaring b and dividing " b^2 " by " a " and you at once get x .

I sent home the specification of a Range Finder on this principle in 1879. The other day I saw a pamphlet dated 1880, published at the Royal Artillery Institute, Woolwich, describing a Range Finder by Captain Roberts, Royal Artillery, on this identical principle, but a friend has just shown me an extract from the Allahabad Pioneer, dated 1st

February 1877, by which it appears that both Captain Roberts and myself were forestalled in our brilliant idea by Lieutenant G. Savage, R.E. I make the above remarks without prejudice to the mechanical principles of my patent. Lieutenant Savage proposed setting off the right angles by means of an optical square (of proved accuracy) taking " b " at a fixed length of 50 yards, making " a " the variable (on which x depends) to be measured on the ground. As b^2 equals 2500, evidently the length of " a " for a range of 2500 yards, would be one yard, for greater distances less, and for less distances greater than one yard.

In my range finder, I intended making the standard length of $b = \sqrt{1000} = 31.623$ yards long (so that " a " for all ranges exceeding 1000 yards would be less than one yard), and measuring " a " on a straight limb on a tripod at A or C graduated to show reciprocals of " a " to $\frac{1}{10}$ th of a yard or 0.36 of an inch, so that the number read off on the scale for any particular observation of X would be the distance x of that object.

If any other base than $\sqrt{1000}$ was used it would only be necessary to multiply the reciprocal recorded on the limb by the square of the base.

I need not task your patience with further particulars of this instrument as I am not able to bring one before you ready for service.

A working model, embodying generally the above principles, was made for me in England, under the superintendence of my father, with the kind help of friends, who took a great fancy to the idea, in which model a number of technical difficulties that cropped up have been most ingeniously overcome.

This instrument is capable of giving the most accurate results with a base of 30 yards up to 3000 yards, but is subject to occasional eccentricities and is not, therefore, in its present form, quite reliable.

After the experience I have gained by a careful consideration of Range finding and its difficulties, my ideas on the subject are much modified and I have decided to alter considerably the mechanism and working of my Range Finder before subjecting it to the criticism of the Committee on Range Finders.

ROBERTS' RANGE FINDER.

Its details are best described by a few extracts from the description pamphlet, (*see Appendix V.*) The mathematical theory, I have already stated, to be identical with my own Range Finder. The prisms used in the telescopes give the right angles, I presume, by a single (interior) reflection. I do not think any permanent reliance can be placed on an instrument purporting to set off angles by single reflection. The erratic flashes of a heliograph give an idea of the error caused in the angle by a slight change in the inclination of the plane of the reflecting surface.

The principle adopted by Roberts for measuring his base by means of two vertical hairs in the telescope, distant from one another a fortieth part of the focal length of the object glass, is essentially that used in Edgeworth's Stadiometer (*see Heather's Mathematical Instru-*

ments, Vol. III. page 85). The following examples showing what great differences occur in x from a small change in X when " b " is small, demonstrate better than any amount of writing or talking how hopeless it is trying to measure a range accurately unless you can make sure of your angles to differences of at least $1'$.

N. B.—(Approximately.) At a distance of 1000 yards an angle of one minute is subtended by an arc of 10.5 inches in length.

TABLE I.
 $b=25$ yards.

X	x	diff: due to $1'$
$0^{\circ} 30'$	2864 yards	... ..
$0^{\circ} 31'$	2771 "	93 yards.
$0^{\circ} 32'$	2685 "	86 yards.
$0^{\circ} 33'$	2604 "	81 yards.
$0^{\circ} 34'$	2528 "	76 yards.
$0^{\circ} 35'$	2455 "	73 yards.

TABLE II.
 $b=200$ yards.

	diff: due to $30'$
$3^{\circ} 00'$	3824 yards.
$3^{\circ} 30'$	3279 " 545
$4^{\circ} 00'$	2860 " 419
$4^{\circ} 30'$	2551 " 309
$5^{\circ} 00'$	2295 " 256

Table I gives the differences due to a difference of $1'$ in the angle X with a base of 25 yards in ranges from 2455 yards to 2864 yards.

Table II gives the difference due to a difference of half a degree in the angle X with a base of 200 yards in ranges from 2295 to 3824 yards.

It must be borne in mind that the greater the range, the nearer to the perpendicular is the path of the bullet at the end of its flight, and, therefore, the smaller the space through which it is effective against an object of any given height. This is the crowning difficulty of Range finding, *i.e.* that the necessity for accurately judging the range becomes rapidly greater as the range increases.

The general conclusion to be arrived at from my rather doleful views on Range Finders is, that such an instrument, suitable for Field Service, has yet to be devised. I have expressed my opinion of the different Range Finders I know any thing about, without hesitation, for any adverse criticism of mine will not damage a good range finder that satisfies the soldiers who have to use it.

The long and short of it is, that a practically useful Range Finder has become an absolute necessity for military purposes, and we must look the difficulty in the face, and not be put off the scent by every

ingenious toy proposed as a Range Finder. We want an article that will stand the test, and meet the requirements of actual warfare, and we certainly have not got such an article at present.

PART II.

LONG RANGE RIFLE SIGHTS.

I have taken up so much time with my remarks on Range Finders, that I fear my audience will not have much patience left to listen to what I have to say about Long Range Rifle Sightings, but the subject is a simple one and I will soon dispose of it.

Considering how ill adopted the present or "top sight" principle of sighting rifles is for aiming, when a high elevation has to be given the rifle, it is surprising that it has not been long ago discarded except for short ranges.

I suppose one reason it has held on so long is, that Brown Bess was sighted in that way, and another, that the Musketry Regulations have hammered into us for so long the axiom, that the line of sight and axis of the bore must be in the same vertical plane. In the musketry regulations it states, that if the firer has occasion to aim at greater distances than that for which his rifle is sighted, all he has to do is "to go on raising his eye"; but the human neck is not telescopic, and the limits of this raising power are soon reached.

General Hardinge, Commanding the Meerut Division, in 1877-78 caused some very interesting experiments in long range rifle fire to be carried out, with the view of testing the accuracy and penetration of the Martini Henry rifle and bullet at long ranges.

The firing was carried out by a squad of marksmen of the 2/60th Rifles, and the sighting was given by an ingenious though primitive method.

A clothes line, from which hung strips of paper of different lengths, was stretched some distance in front of the squad lying down who aimed at the lower end of the paper to get the necessary elevation which was ascertained by a few trial shots. The results of the practice, even at ranges over 2,000 yards, were satisfactory both as to direction and penetration, and caused General Hardinge to remark on the desirability of a sight to be attached to the rifle for these long ranges in place of the clothes line arrangement. It was this remark that set me thinking on the subject, resulting in the "Happy thought" of side sights, the V back sight fixed, and the tip of the fore sight moveable to give the proper elevation. As I have already said I have had this idea patented, and hope soon to see it in use in the service.

These sights will not interfere with the use of the present sights, and are arranged to be out of the way when not required for use.

There is little doubt that the secret of the acknowledged success of this method of sighting is, that it does away with the necessity of "raising the eye, and craning the neck."

Recent experiments at Shoburness, followed up at Hythe, have proved incontestably the benefits of this method of sighting by means of which a trained marksman is enabled (provided he knows the range) to get the full power out of his rifle.

I cannot describe the sights better than from the specification of the patent, with the aid of these diagrams, and this dummy rifle with sights attached.

I think it may be stated, without fear of contradiction, that if you discard the "top sight" principle of aiming for ranges requiring a great elevation of the rifle, there is only the side sight principle to fall back on, aiming along the bottom of the rifle being of course out of the question. After a few experiments, the near or left side of the barrel was found the best for the sights. As far as facility of aiming is concerned, the advantage of a fixed back sight, (the elevation being given by lowering the top of the foresight), over the old method is obvious.

As stated in the specification, the vertical plane through the sights is one inch to the left of the vertical plane through the line of the fire, or axis of the bore, the result being that the bullet will hit one inch to the right of the object aimed at, and if this object be the left eye of an enemy, the result makes no practical difference to either party concerned.

There can be little doubt, if these new sights are brought into general use in conjunction with an effective range finder, that the zone of aimed fire will be considerably increased, and that small bodies of picked marksmen thrown out in advance of the main line will at least compel the enemys artillery to keep at a respectful distance.

But the practical application of these sights in actual warfare, and their possible effect on tactics, are subjects beyond the limit of this lecture, and on which I will not venture my opinion. I believe the inventive branch of the War Office has been much exercised as to how to get these side sights out of the way when not wanted for use, but has not been able to hit on any plan very essentially different from my first rough idea. In fact all that is wanted is a sight that will fold flat when no longer required for use, and swivel back into a bed between the barrel and the stock, there to remain until again required.

MEERUT, }
August 25th 1881. }

APPENDIX I.

NOLAN'S FIELD RANGE FINDER.

Description of the Instrument.

The Range Finder consists of:—

Two instruments.

A calculating disc.

A tape.

An instrument has the following principal parts, viz :—

- The main telescope.
- The cross do.
- Plate, with divided arc.
- Arm and vernier.
- Cylinder and face.

The main telescope has its axis marked by two cross wires, and is fitted with a focussing screw. It rests on two "V"s, one at each end of a bar, in which slots are cut to fit the head of a tripod or a bar suitable for the tangent scale socket in a gun. On these V's are placed two small sights which are used for laying on distant objects; the field of the telescope is so limited that much time would be lost if this expedient were not adopted.

A traversing screw is fitted to the rear V for final adjustments.

Over the main telescope is placed an arm working on a pivot near the eye glass end; over this pivot, and at right angles to the arm, is the cross telescope; at the other extremity is a vernier which reads a graduated arc fixed near the object glass of the main telescope.

The cross telescope has its axis marked by cross wires, and is protected from injury by a cylindrical case fixed to the main telescope; on one end of this cylinder is a white face with two marks showing its vertical axis.

Vertical motion can be given to the main telescope by a screw placed in the head of the tripod.

Vertical motion of the cross telescope is obtained by a screw which is placed just in rear of the focussing screw of the main telescope.

When (Fig. I) the instruments are at A and B, the lines of sight of the main telescopes, laid on the object X are in the direction A X, and B X. The cross telescopes are laid each on the face of the opposite cylinder, in the direction A B, and base angles can, therefore, be read by the arc and vernier.

Either instrument can of course read angles in one direction only.

APPENDIX II.

WATKINS' FIELD RANGE FINDER.

Description of Instrument.

1. The instrument is double reflecting, on the principle of the ordinary sextant, but is so constructed that the near object is seen by reflection, and the distant one by direct vision, thus rendering it easier and quicker to use, more particularly in hazy weather.

2. There are two patterns in the service, differing only in size and weight; that for the artillery being 10 inches long, $3\frac{3}{4}$ inches wide, and $1\frac{3}{4}$ inches deep, and weight with its case about 5 lbs.

That for the Infantry $5\frac{3}{4}$ inches long, $2\frac{1}{2}$ inches wide and $\frac{1}{4}$ inch deep, and weighing about $1\frac{1}{2}$ lbs.

The instrument consists of a brass rectangular box, carried, when not in use, in a leather case slung over the shoulder like an ordinary field glass. When in use half of the cover is thrown back, thus exposing the right half of the instrument. In the cover is carried a key for adjusting, and in the artillery pattern, a small telescope for use in taking long ranges. There are two eye-holes fitted in the large pattern with moveable slides, so that the instrument can be used with or without the telescope. One eye-hole (R) is used for taking the right angle A and the range x and the other (V) for measuring the length of the base.

6. The fittings supplied for use with this instrument are:—

- (a). A wire cord, 18 feet long, in a leather case.
- (b). A steel tape, in case, for occasionally testing the cord.
- (c). Three steel pickets, fitted with leather discs, to render them conspicuous. These are carried in leather buckets.

(d). For mounted men two knee-halters.

7. Two men are generally employed as range-finders, though if necessary, the service can be performed by one

Where carried. only. No. 1 carries the instrument slung over his shoulder, like a field glass, one picket (when mounted strapped to the saddle on the off side), steel tape in case, knee-halter (if mounted).

No. 2 carries wire cord in case, two pickets (when mounted strapped to the saddle on off side), knee-halter.

APPENDIX III.

Just before coming to Simla to read this paper I was lent this instrument, a Watkin's Range Finder that has been in use for some time.

You can observe in the steel plate, against which the sharp point of the screw works, a groove cut by the point and in which it works up and down instead of gilding along the face of the steel plate horizontally as it imparts circular motion to it round* W, the pivoting point of the arm on which the "b" or base scale is engraved.

The explanation of this peculiarity is simple. When the W arm is in its initial position the screw is exactly at right angles to the plane of the steel plate, and, therefore, when the screw is turned round its point is bound very soon to bore a hole in the steel plate, and of course then the point cannot move independently of the plate into which it is jammed; the plate has a horizontal circular motion round its pivot W, and the point of the screw must either break off short, cut a horizontal groove in the plate, or move in a vertical circle round the same point W, cutting a vertical groove in the plate. It adopts the last alternative giving, in consequence, an up and down play in its bearings to the cylinder on which the base scale is engraved; that this is the case you can easily see from this particular instrument.

The result of this eccentricity must I fear be fatal to extreme accuracy.

NOTE.—Appendices IV and V, with the diagram referred to above, will appear in the next number of the Journal.

* See diagram with Appendix IV.

Fig. 1.

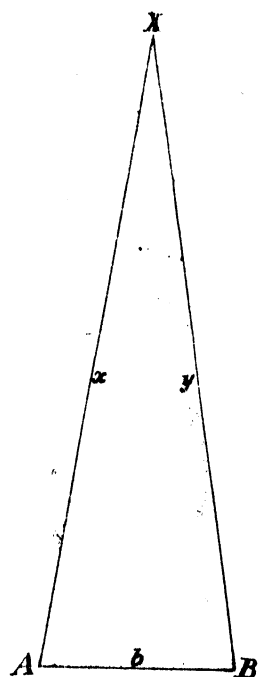


Fig. 2.

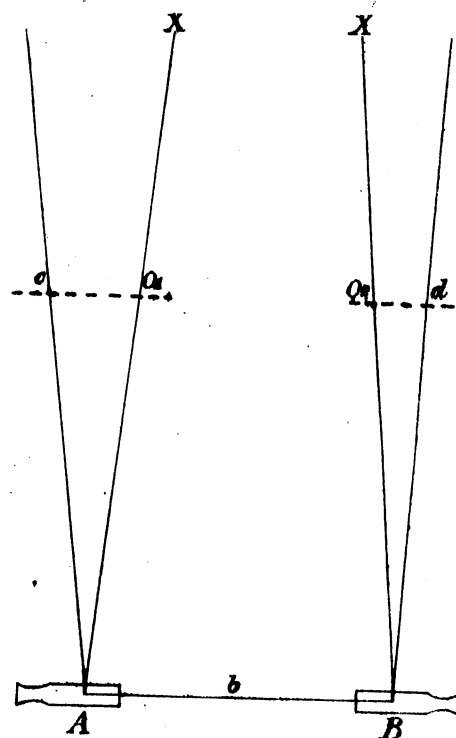


Fig. 3.

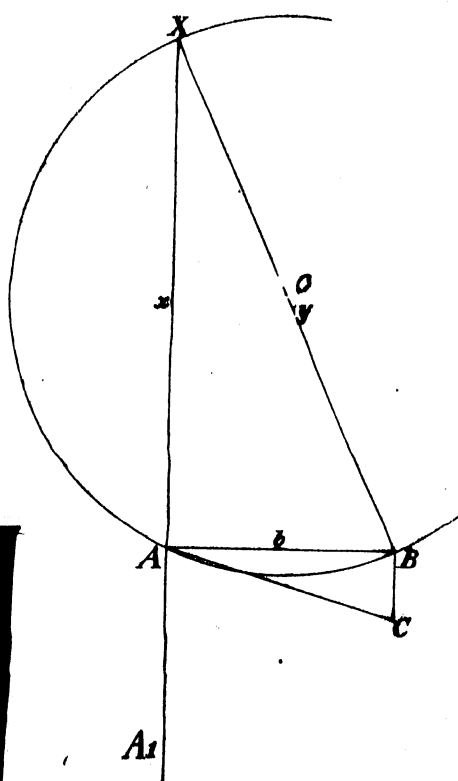


Fig. 4.

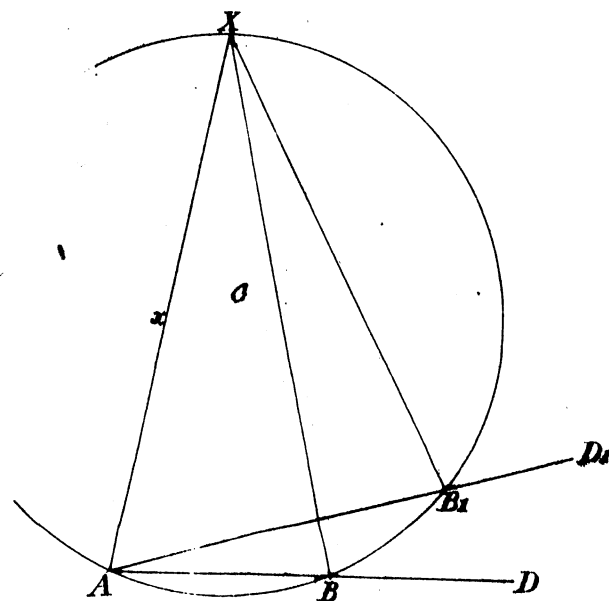
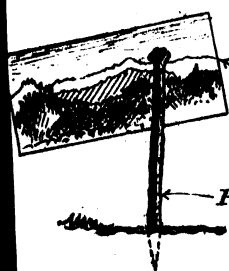


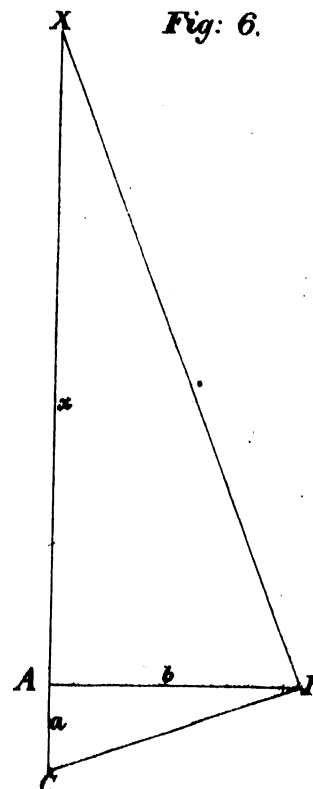
Fig. 5.



{ Prism picture bobbing about.
{ Foreground 3000 yds away.

Pole or picket.

Fig. 6.



IV. MUSKETRY TRAINING.

MEMORANDUM BY
MAJOR-GENERAL H. R. BROWNE.

There has been much in our recent campaigns to shew that the instruction of soldiers, in the use of their arms, has not kept pace with the improvement of the arms themselves.

So far as target practice is concerned, the shooting of the army, both European and native, is decidedly of a high standard, bearing favourable comparison with that of any of the great continental forces.

But, on service, this high standard is not maintained. The expenditure of ammunition in proportion to results, is not satisfactory, being little, if at all, less than in the days of inferior arms. Nor has it appeared that results, such as might be expected from breech loading rifles of a very superior description, have been generally obtained, even during engagements with masses at short range.

I propose to examine this failure, tracing out the probable causes, and considering what practical remedies may be applied. The first question is—Are the officers of the army, as a body, efficient instructors? To this I must answer—No—the reason being that they are not, with few exceptions, in the *habit* of instructing. The system has been to appoint special instructors to regiments, who have, to a great degree, supplanted the company commanders and their subalterns. As a consequence, the greater number of officers have but a superficial acquaintance with a subject for which they hardly feel themselves responsible.

Next, are they generally good tacticians in utilising, to the best advantage, the fire of their men? Again the answer must be—No—It is not their fault for they have not the necessary practice.

The same replies to the same enquiries, apply with equal force to the greater number of the non-commissioned-officers who, from the same cause, are not generally either good instructors or good commanders.

The root of the failure lies in this, that the company commanders, their subaltern officers, and non-commissioned-officers, do not, *as a rule*, train and instruct their men.

They are not, as a rule, required or accustomed to exercise their judgement. It seems to be forgotten that the commander of the company is the *Captain*, and that the Commander of the section is the Sergeant or Corporal appointed to take charge of it.

The general system of instruction in Musquetry has remained almost unchanged in character since its first introduction, some five

and twenty years ago; some details have been added and some altered, but in principle, and in all leading features, it has "stood still."

The system, well adapted to the state of things in its early days, and *still* well suited for the instruction of recruits, needs considerable enlargement in its application to the higher training necessary for officers, as well as soldiers, in the present day. Probably not much can be done in *England*, where ranges are exceedingly limited and where almost every acre of ground is enclosed and very jealously guarded; nor is there much greater scope at most of our remaining foreign stations. The chief field of improvement, must be *India*, where facilities exist at most stations, for more extended and more practical instruction. Fortunately a large portion of the army is in a position to take advantage of these facilities.

It may be well first to consider the arms and equipment of the soldier.—He has a magnificent rifle, so far as its *powers* are concerned, but is it always *suited* to him? Has the tall man with a long arm or the short man with a short arm, a *stock* of proper length? Does the *bend* suit men with long and short necks equally well? Is the *grasp* a convenient one? Unless it has recently been altered, that of the Martini rifle is particularly awkward.

These are all points of recognised importance amongst sportsmen and rifle shots, to whom the soldier is no exception. At least five or six classes of *stock* of different *lengths* and *bends* ought to be issued, and very great care taken in their distribution. At present there are but two lengths of stock and no other difference that I am acquainted with.

Is *equipment* all that can be desired? Hardly so—can any thing be less adapted for *service* than the stiff unhandy pouch—heavy, not readily accessible, and impeding free movement? There is no use in placing in the soldiers hand improved arms, capable of sustaining rapid fire if his equipment prevents equally rapid access to his cartridges.

The Henri Martini rifle, used by a fairly trained soldier, *ought* to maintain a rate of fire of at least ten shots per minute—but practically the average rate of independent fire hardly exceeds four shots, and, from men standing in close order, the rate is less, because they cannot get their ammunition with ease and readiness.

The equipment also, from its general stiffness and weight, the width of the belts and thickness of the leather, is a principal source of fatigue and exhaustion. A much lighter, and equally serviceable equipment, might be constructed with the greatest advantage and economy.

Again—Is the soldier always *clothed* in such a manner as to enable him to move and use his rifle with freedom? In many instances—No—There is a desire to obtain a smart appearance by means of a tight coat and trousers in which he can hardly bend—a fashion not in accordance with the *intention* of any regulation that I know of, but nevertheless common enough. A loose easy dress tends much to *service* efficiency, of which many native regiments in particular afford excellent example.

The next question is *Ammunition*.

Is the annual supply for practice sufficient ?

Is it expended in the most advantageous way ?

Is the use of blank ammunition desirable or not ?

The annual allowances of ammunition for practice in the great continental armies are, I think :—

France	120	} Rounds. {	The English allowance being limited to 90 rounds.
Austria	...	...	110
Germany	...	...	130

I would certainly advocate an increase to 120 rounds which should include *officers* in the computation.

The present mode of expending the practice ammunition affords a good course of preliminary instruction for recruits, but continual firing at fixed marks and known distances, and the fact that the whole practice of each individual is limited to some ten or twelve days of consecutive firing in each year, can hardly be accepted as satisfactory in the case of trained soldiers.

The use of blank ammunition—at any rate in the way in which it is frequently used—is *undoubtedly* a fruitful source of *habits* of wild and reckless firing and requires a strict limitation both in quantity and application. No doubt, to a certain extent, its use is desirable, to give some resemblance to *service* when troops are brought together for exercise, and also to accustom them to the noise and excitement of action, but if expended, as it only too often is, in a careless heedless way, *habits* are induced that are not easily shaken off.

I would advocate the reduction of the annual allowance of blank ammunition to regiments to 40 rounds per man. The difference between this and the present allowance would cover the cost of an increased issue of ball ammunition for practice.

A certain amount of blank ammunition might, if considered necessary, be placed at the disposal of superior officers for use on special occasions.

I will now turn to *practice*, and on this question, I think, it must be admitted, that there is not an adequate development of the “ shooting power ” of the soldier after he has passed through the recruit stage ; he becomes at best “ a fair shot ” at a fixed object at known distances and under favourable conditions. His instructor stands at his elbow, and the officer or non-commissioned-officer who will command him in action, has, as a rule, but little to say to him. These are *not service conditions*.

The first and by far the most important thing is—that he should *learn to be a good practical judge of distance*—officers and non-commissioned-officers need this qualification more especially to enable them properly to “ direct their fire.” At present officers are hardly exercised at all ; and the practice of the rank and file is not only insufficient, but too much limited to known localities and objects.

Officers should be required, *frequently*, to march their men to some distance from their quarters ; halting occasionally in *new situations*, for

the purpose of judging the distances of any natural or artificial objects in view, such for instance as trees, houses, bridges, &c., both on flat and hilly ground, and under different lights and states of weather—officers taking part in the exercise with their men. The point is far too important to admit of any question of *convenience*. Half the advantages of the best modern arms are thrown away if they are in the hands of soldiers (or officers) unable fairly to estimate *distances*.

The most useful instruction is probably from 300 up to 700 or 800 yards. The trajectory of the bullet is sufficiently flat to neutralise errors up to 300 yards, and beyond 700 or 800, *judgement* cannot be much relied upon, and there is generally time for “trial shots,” or for the use of some kind of instrument for “range finding.”

Respecting practice in firing. When once a soldier has passed his first course of instruction, and has learnt the use of his arms and the leading principles of shooting, his farther annual training should take a much wider form than it has hitherto done. I would not entirely discard practice at targets at known distances; it is well to keep up, to a certain degree, skill of that kind, but it ought not to exceed an expenditure of about one-third of his annual supply (say 40 rounds), leaving the remainder entirely available for shooting under “*service conditions*.”

I would classify the annual course of the trained soldier in two simple divisions:—

First *Target practice*—second, *Service practice*.

In conducting the former, some regard might properly be had to weather, wind, light, &c., for the chief objects are, the attainment of accuracy and steadiness in shooting, and the acquirement of *habitually* good methods of handling the rifle.

But during “*service practice*,” all considerations of wind, weather, light and position, should be *absolutely set aside*. It is further highly essential, that a considerable portion, if not the whole, of the “*service practice*” should take place *after exertion*, such as marching one or two miles, running a short distance, leaping a ditch, making a shelter trench, without *in any case resting before firing*.

“*Service practice*” should consist of firing at moving objects—shooting in extended order in *all* positions—sectional volley firing—and in attack or defence of prepared positions at unknown distances, and should be *absolutely* directed and conducted by the officers and non-commissioned officers on whom the duty would devolve on the field.

I would strongly recommend that only *one sight* (the lowest with which the rifle is fitted), should be used during *service practice* up to 300 yards—the attempt to adjust sights in action at short ranges does much more harm than good.

Nothing has perhaps tended so much to prevent the general attainment of good shooting under “*service conditions*,” than “*figures of merit*” and the system of rewards. The opinion may seem somewhat heretical, but let us examine for a moment.

How are these "figures of merit and rewards" usually obtained? Is it not by careful avoidance of all *service* conditions?

Fatigue is avoided.

Exertion is avoided.

Wind is avoided.

Bad light is avoided.

Haste is avoided.

Awkward situations are avoided.

Indifferent ammunition is objected to.

A specially trained Instructor assists; not unfrequently taking the place of the officer or non-commissioned-officer who ought to command.

All this is done for this simple reason—that satisfactory "figures of merit" and individual rewards cannot be easily obtained *without it*.

I advocate the abolition of *both*.

Under present arrangements, the annual practice of soldiers is limited to 10 or 12 *consecutive* days in each year—during more than eleven months following he rarely fires a shot—surely this is not a practice that can be advocated! Does any *real reason* exist why each soldier should not fire some portion of his annual supply on one or two days in *each month*,—at any rate during those months when the climate will admit of out door exercises? What is to prevent regimental arrangements such as will enable captains, assisted by their own officers and non-commissioned-officers, from having frequent practice throughout the year? It is a mere question of regimental detail. If it is argued that *regimental Instructors* and their assistants would find difficulties—this only adds one to the many other reasons why these Instructors should cease to exist; surely, on every sound principle, the legitimate instructors of the soldier, in time of peace, are the officers and non-commissioned officers who are to command and direct him in action!

OCTOBER 1881.

V. ARMY SIGNALLING—PESHAWUR TO KABUL.

BY
LIEUT. H. WHISTLER SMITH, R. E.

The Heliograph, its construction and use, has been so ably and fully described in two lectures delivered at the United Service Institution by Mr. Goode, in June 1875, and by Major Wynne, in March 1880, that it is with some diffidence that I venture to bring the subject before the United Service Institution of India. The Heliograph, our chief and prince of signalling instruments, cannot but be prominently alluded to in any account of useful or extensive signalling operations in India, and I have been led to think that a sketch of the work performed along the Khyber line and in the neighbourhood of Kabul, and a few notes in amplification of what has already been said concerning the Heliograph, may prove of interest.

Sun-flashing instruments have been made use of in European survey operations from the early part of this century, but the first ever used in India, was the Heliostat or Heliotrope; it has been used by the Indian Survey for half a century, having been imported by Colonel Everest in 1830; it was introduced to furnish luminous signals for observation instead of opaque objects, as cairns of stones, etc., which had previously been erected over Trigonometrical stations as marks for observations. Heliotropes, when set up for observation in the course of survey operations, are not flashed, but are directed steadily at the observer, who also has a Heliotrope, which is flashed occasionally at the signaller to attract attention when the signalling trope is not correctly directed. A system of flashing is preconcerted between the observer and the signaller, by means of which the latter is informed when the observations to the station are completed and he should proceed to another station. No attempt has ever been made to converse by signalling, for though this might occasionally be desirable, it would necessitate the employment of a superior and better educated class of men than the survey signallers, who are menials serving on Rs. 5 to Rs. 8 per mensem.

The Heliotrope or Heliostat then, as used by the survey department, is nothing but a fixed light used for observations, not as a signalling agent. To Mr. Mance, of the Indo-European Telegraph Department, the credit is due of having converted the Heliotrope into a signalling instrument by a simple mechanism and by applying to it the Morse alphabet. Whatever others have since done to improve the Heliograph, it was through his energy and perseverance that its use was brought to the notice of the authorities. He elaborated the idea of the Heliotrope by fixing the glass mirror on a tripod stand with horizontal and vertical adjusting screws. To the base of the instrument, he

attached a small lever similar to the simplest form of Telegraph key, connected to the mirror by a brass rod; then by depression of this key for a longer or shorter period, long and short flashes were given representing the bars and dots of the Morse alphabet.

Mr. Mance first made use of his instrument at the Jask telegraph station in 1869, and it was brought to the notice of the Bombay Government, in December 1871, by Colonel Sir W. J. Merewether, then Commissioner in Sind; and two instruments were soon after supplied to the school of Telegraphy at Poonah for trial and report. Lieutenant Stevenson, of the 66th Regiment, having been previously instructed by Mr. Mance at Kurrachee in the method of working them.

Captain Luck, 15th Hussars, then instructor of army signalling, furnished a favorable report to the Quarter Master General, in May 1872, as to the working of these instruments; and on this report a recommendation was made by the Military Department that the Heliograph should be subjected to a further series of tests by the Instructor of army signalling in Bengal, and if the opinion recorded of the suitability of the instrument be favorable, that the inventor be invited to carry out such modifications as would render it appropriate for army purposes.

Captain E. Begbie, of the Madras Sappers and Miners, considered the principle of the Heliograph, as a signalling instrument, wrong and designed his Heliostat, which is now used in Madras instead of the Heliograph. By it the solar image is kept constantly and steadily fixed on the distant station signalled to, and the flashes required for the formation of letters are formed by the opening and closing of a venetian shutter which is perfectly independent of the mirror; thus the act of signalling in no way affects or deranges the alignment and an unvarying blaze of light can be secured by attention to the regulating screw. The difference in principle of the Heliograph and Heliostat is, that in the former the plane of the mirror is altered to obtain the necessary flashes, and in the latter the flash is kept directed on the distant station but obscured by an independent and intervening shutter, the leaves of which are opened when it is required to expose the flash for signalling; other differences are merely of mechanical detail. Both the Heliograph and Heliostat were worked at the Bangalore Camp of Exercise in 1874, before Lord Napier.

Army signalling was not introduced into Bengal (or I may say India) as a regular practice until it had made some way in England; it there started in a connection with Field Telegraphy as a duty of the Royal Engineers, forming a regular part of the instruction at the S. M. E. Chatham, both for Royal Engineers and officers of other branches of the service studying there. One of these latter, Major Hudson, B. S. C. took a special and energetic interest in the work, and on his return to India in 1871, was appointed the first instructor in Bengal of army signalling and telegraphy.

In the mean time a general interest had been excited and attempts were made to instruct soldiers, chiefly at Roorkee and Chakrata, where there are Royal Engineer officers with the Sappers, who had been instructed in England.

It was in 1872 that the then home plan was adopted of referring the instruction to the Royal Engineers; Lieut. G. R. R. Savage, R. E. was appointed instructor, and the Commandant of the Sappers and Miners ex-officio Superintendent of army signalling and telegraphy. At this time some instruction in Electric Telegraphy formed part of the course, but it was subsequently discontinued owing to the delay it occasioned and to its not being absolutely necessary; in August of this year Mance's pattern of Heliographs was received at Roorkee for trial, but as they were not found suited to field service, Lieut. L. F. Brown R. E. constructed a pattern which was afterwards improved by Lieut. Savage into the existing regulation pattern and which was officially approved of by Government in 1875. When this pattern was introduced into Zululand, during the late war, all Mr. Mance's instruments were superseded by it.

The first attempt at signalling any great distance was made in 1873, when daily Heliographic communication was carried on between Chakrata and Roorkee, a distance of 60 miles, the daily telegrams being flashed up and so saving 2 or 3 days by post. The Heliograph was employed by Lieutenant Savage at the Delhi Camp of Exercise in 1875-76; he placed the various divisional camps in communication with a party on the Kootab column which again was in communication with the Field Telegraph Office at Head Quarters.

I would here note that, in the summer of 1867, Captain Tisdall R. E., and his brother Lieutenant Tisdall (now dead) constructed a couple of rough Heliographs and used them at Chatham for usual signalling. The then Royal Engineer Committee decided against the arrangement on account of the cloudy sky of England not being suited to it.

It is said that the Russians made use of a sun flashing instrument at the siege of Sebastopol, but the first occasion of one being used by us on service was in the Duffla expedition.

Captain E. Begbie, with a few native signallers, joined the force from Madras; the country on first entering it was flat and covered with dense forests, but when the force entered the hills, signalling was carried on to the extreme point that was reached. The practice obtained in India, at the camps of exercise, and in the Hill stations, had established the great utility of the Heliograph, but it was in the Jowaki—Affridi expedition of 1877-78, that it was brought so prominently to notice by Captain Wynne of the 51st L. I. who was in charge of the signallers of the Peshawar column.

He kept up communication with Peshawar and Fort Mackeson, during the time the force was encamped on the Sargashi ridge, and from the Sargashi ridge with the force that advanced through Bori Valley to Pastaoni to meet the Kohat column under General Keyes. In these early days Captain Wynne saw the necessity of assimilating the telegraphic and army signalling signs and abbreviations, and also of having the signallers encamped together, rationed and provided with carriage independent of regiments.

When the Afghan war broke out in 1878, army signalling was recognized, Lieut. G. Savage, Instructor of Army Signalling in Bengal, being appointed Superintendent of Army Signalling and Telegraphy to the Kandahar column, with Lieut. Dickie, R.E., as Assistant; Captain Wyne, 51st Light Infantry, Superintendent Army Signalling to the Kurram Division, and I had the good fortune to be appointed to the charge of the signallers of the Peshawar Valley Field Force under Sir S. Browne. I arrived at Peshawar on the 18th November 1878 and found that, under the orders of Major Pearson and Lieutenant Currie, 2-9th Regiment, signallers had been collected from the Regiments of the Peshawar Valley Field Force and 2-9th, and had been told off into six parties of 4, each party being fitted out with its own transport of two mules, and its signalling apparatus, which consisted of 1 Heliograph, 4 flags, 1 hand lamp, books and pencils.

The following orders, sanctioned by His Excellency the Commander-in-Chief, were drawn up for our guidance.

1. All signallers are to be made over entirely to the officer in charge of signalling, who will arrange for their pay, rationing, discipline, carriage, camp equipage, etc.

2. Much inconvenience and delay is caused by attaching signallers to regiments and having to get things through the medium of regiments to which attached, instead of direct from the commissariat. Signallers must, therefore, be treated as a distinct department.

3. The whole of the signallers should be put into groups (according to skill and acquirements) of four men, with a non-commissioned officer in charge of each party. The officer in charge of signallers to have the power of giving Lance rank if necessary, reporting to regiments having done so.

4. As "a group" may at any time have to be detached suddenly with a picquet, each party should be complete in itself, and carriage must be apportioned off by "groups" and not by individuals.

5. When "groups" are made over to Brigades, they should be under the immediate charge and orders of their Brigade Major. One tent should be allowed to each group, and as signallers have no time to look to their meals, one bhisti per brigade party must be allowed, also cooking utensils.

6. Men will require but little pay when once they leave cantonments. The officer in charge should receive from the commissariat advances from time to time, and he should disburse this in payments of Rs. 5, recording in form of contingent bill, and accounting direct to Paymaster, Rawul Pindi, who will adjust with regiments. At the end of each month he should send a memorandum of charges to Regiments, showing the individuals to whom money has been given.

7. Signallers should draw rations direct from the commissariat. The non-commissioned officer of each party should be provided with a ration book or card, on which should be entered, opposite the day of the month, the rations drawn, so that, on presentation to the commissariat at any post, it will be seen up to when the party has been rationed; when more than one group is together, the senior non-commissioned officer

is to draw for the whole party, on indent signed by the signalling officer or Brigade Major, and he will enter in the ration book or card the number of rations issued.

8. It is to be clearly understood that signallers are to be admitted into any hospital, regimental or other, attaching to regiments.

9. The officer in charge of signalling is to have entire control over the men in matters of discipline, but when detached, signallers will be under the orders of their immediate commanding officer. Except in extraordinary cases, signallers are not to be interfered with. All matters should be left to the officer in charge of signallers, or in brigades, to Brigade Majors.

10. Signallers should always take their arms, ammunition, and great coats with them, and carry one day's ration in haversack.

11. Signallers are not to be used for the purposes of carrying messages. All staff and other officers will make their own arrangements for delivery of messages.

The signalling detachment marched from Peshawar to Jumrood on the 19th November 1878, and on the 20th we received the following orders from Assistant Quarter Master General.

One party to remain at Jamrood Fort, to which place the telegraph line had been extended.

One party to go with the 1st Brigade, (Brigadier General Macpherson), one party with the 2nd Brigade (Brigadier General Tytler); these two were the turning brigades. My orders were to proceed with them and, if possible, to establish the 1st Brigade party on some point on Rotas Hill, so as to communicate with General Tytler, who was working round to Kata Kushta, with Jamrood Fort, and with a station to be established on Sarkai Hill.

Two parties were to proceed with the advanced guard to the Sarkai Hill, and one party, under Lieutenant Currie, was to keep with the advanced guard; these 3 parties were under the immediate orders of Major Pearson. If time had allowed, these orders could have been carried out and the turning Brigades could have been kept in communication with head quarters; as it was, before the signallers and their escort could reach the top of Rotas, Ali Musjid was taken. Major Pearson fixed a station at Sarkai Hill, and communication was established between Jumrood and Ali Musjid as soon as the latter Fort was occupied. This station was several times attacked by Affridis and had to be changed.

After the capture of Ali Musjid, the cavalry, 1st and 2nd Brigades, marched through the Pass by Brigades reaching Daka on the 24th, 25th and 26th November. The 3rd and 4th Brigades remained at Ali Musjid. At first sight, it seemed almost hopeless that we could ever establish signalling through the Khyber, with the number of signallers and instruments at our disposal. It must be remembered that our road wound through a mass of unknown hills, that our choice of stations was very limited and depended entirely on the military posts selected.

As there were not sufficient instruments to establish stations at once through the Pass, it was thought better at first to connect Daka with Lundi Khana and to complete the break as soon as more instruments could be obtained and suitable stations could be formed.

On the 30th November, Daka and Lundi Khana were connected by two intermediate parties who proceeded daily with escorts from Daka and Lundi Khana. By the 11th December, extra instruments had been obtained from Peshawar and from the regiments of the force, and on that day signalling was established through the Pass, the stations finally settled being Sarkai, Ali Musjid Fort, Kata Kushta, a small rocky hill in the Pass near Lundi Kotul camp, and a hill (afterwards called Pishgah) about $\frac{3}{4}$ of a mile from Lundi Kotul camp; this latter proved a most useful station as it was the only point near camp from which Daka Fort could be seen and it commanded a splendid view of the Barikab plain and country towards Jelalabad. It was by no means the highest hill about, and I would here beg to remark that signallers ought to remember that, however good a high hill may be to get a view of and learn the country round, the top of it is seldom the best adapted for a signalling station.

Shortly afterwards a brigade moved to Basawul; signalling was kept up from Daka by means of a station on the hills above the Fort, and on the 17th December the force advanced to Jelalabad, Heliographic communication being established between Dakha and Jelalabad via: hills above Ali Boghan, on the 8th January, the delay again being on account of want of instruments and men.

Peshawar and Jelalabad, some 90 miles, were then in signalling communication, stations being at or within easy distance of every post on the line. Looking back, there seems to have been delay in establishing these stations, but it must be remembered that, at the commencement of the war, the Khyber Pass and country beyond was an unknown land to us; want of experience prevented our realizing the number of instruments and men required, and it was rather hard to have had so many signallers and men drawn from us at the outset in order to establish stations through the Khyber. We started with an organized body of 24 signallers and 6 Heliographs, whereas, to work the Khyber Pass alone, we ought to have had 12 instruments and 36 signallers, and to continue the line on to Jelalabad, connecting all the posts, 7 more instruments and 21 signallers—this only allowing 1 instrument and 3 signallers at a terminal station, 2 instruments and 6 signallers at an intermediate station.

On the formation of the 2nd Division of the Peshawar Valley Field Force, Lieutenant Spragge, 51st L. I. was appointed Superintendent of Army Signalling and took over, on the 4th January, the stations in the Khyber. As the station on Sarkai Hill had twice been attacked, he altered it to a hill nearer Ali Musjid, and in order to get Jumrood from it, he established a station on the plain about $1\frac{1}{2}$ miles to the south-west of Jumrood Fort*; he also did away with the station on the

* Afterwards done away with as a defensible post called Fort Maude was built at the top of Mackeson's incline, from which both Fort Jumrood and Ali Musjid could be seen.

hills above Daka and worked Basawul and Barikab direct from Pisgah ; the station above Daka had been established by us as it was a good look out post, watching Lalpura and country towards Basawul.

In January 1879 a force proceeded to the Bazar Valley ; Lieutenant Spragge kept up communication with Ali Musjid during the time the force was away, and also, in April, with Lundi Kotul and Dakha, when a force went through the Loi Thilwan Valley which lay to the north of Lundi Kotul.

On the 10th February 1879, the signal stations along the line of the 1st Division were closed and the men collected at Jelalabad, as it was thought advisable to give them a rest, overhaul instruments, etc., and reorganize the signallers into parties in case of an advance. The telegraph line had by this time been well established as far as Jelalabad.

Early in April, part of the Division advanced to Fateyabad and, after a few days halt, to Safed Sang, communication being established with Rozeabad and Fort Battye as the force advanced. During the winter, signallers accompanied all reconnaissances and signalling was always kept up between head quarters and any force that was out ; thus in February, two columns crossed the Kabul river at Jelalabad and Chardeh, with a view to disperse a large body of Mohmunds who were working round from Lalpura to the Kunar valley ; signallers accompanied both columns and, through the signal station on the Ali Boghan Hills, kept head quarters informed of their movements. Again, in March, a force under Colonel Jenkins went into the Lughman valley ; while the force was in the valley, a signalling station, with a strong escort, was established on the Siah Koh Hills above the Darunta Gorge through which communication was kept up with head quarters. It was on this occasion that we found the hill from which we afterwards got Latabund signalling post.

Signallers also accompanied Captain Leach when he was out surveying the Lowa slopes of the Safed Koh ; and when General Tytler proceeded to Maidamak to punish the villagers for their attack on Captain Leach's party, mounted signallers of the 10th Hussars went out daily from Jelalabad to a hill some 5 miles from camp and kept up communication with head quarters.

Early in May, nearly the whole of the 1st Division was concentrated at Safed Sang, the remainder garrisoned Jelalabad, Fort Battye and Rozeabad ; signalling was kept up daily between these posts (as also along the 2nd Division posts), while parties of four signallers complete, with their own tents, carriage, etc., were attached to Divisional and Brigade head quarters ready in case of an advance. On the 30th May, we received information by telegram from General Watson, at Kurram, that a party of signallers had gone up the Safed Koh by the Bodni Pass, for the purpose of signalling with Jelalabad on the 31st. All that day a sharp look out was kept, and at 3 P.M., at Safed Sang, we saw the flash of the Heliograph from the top of the Safed Koh. Captain Straton was with the party and we sent the following message—"From Sir Sam Browne at Safed Sang to General Roberts at Ali Kehyl. Congratulations on opening communication, sorry we shall not meet at

Kabul." Signalling from the Safed Koh to Jelalabad failed, as all day they had one of those delightful dust storms for which Jelalabad in the hot weather was so famous.

For the return march signallers were attached to each Brigade head quarters, to the rear guard and to the two Regiments that marched a day ahead of the rear guard. The rear guard left Safed Sang on the 8th June, the telegraph line being rolled up one day in advance, and its place was taken by the Heliograph by day and by Begbie's lamps, when necessary, by night. At Jelalabad the rear guard was halted for 3 days to clear stores out of the Fort, signalling could not be kept up with Basawul, and the troops ahead at the Ali Boghan post had to be withdrawn; signallers remained with the rear guard ready to open up communication if necessary; we left Jelalabad on the 14th, arrived at Daka on the 16th, and from that date signalling of the 1st Division Peshawar Valley Field Force ceased but was kept up through the Pass by the Khyber Brigade.

During the first phase of the Afghan campaign the signallers had their full share of the casualties and pleasures of that return march; out of the 30 signallers that I had in regular work as Brigade signallers, 2 died of cholera, 1 was drowned in the Cabul river, 1 was shot at Sarkai hill, another wounded and 1 invalided; the conduct of the men throughout was admirable and we had not a crime from first to last. The grant of working pay to signallers was the greatest boon and did more to keep the men efficient and keen after their work than anything else.

In the second phase of the Afghan war I had the good fortune to be reappointed Superintendent of Army Signalling on the Khyber Line, under Sir R. O. Bright. I arrived at Lundi Kotul on the 10th October 1879, and found that signalling had been kept up during the hot weather at all the old Khyber posts, by Lieutenant Scudamore, 1-12th Regiment, Signalling officer to the Khyber Brigade. At this date General C. Gough had already reached Barikab and was in communication with head quarters at Lundi Kotul via: Pisgah Hill. As the telegraph line through the Khyber was thoroughly well established, it was thought better to withdraw all the signallers and take them on as quickly as possible to the front where there was no telegraph line and where they were urgently required; signalling through the Khyber was to be re-established as soon as more men and instruments could be obtained from India. This was done; we caught up General Gough on the 22nd at Rozeabad, and on the 23rd we had all the old stations established between Lundi Kotul and Safed Sang. The Fort at Jelalabad was exactly as we had left it in June; not a stick taken away, while at Safed Sang the only traces of our camp were the walls of the hospital and the parapets of the Fort. Some hundreds of maunds of grain, that we had handed over to Yakoob Khan in June, had been kept by a guard of his troops until two days before we arrived; hearing of our advance the guard had bolted and our old friends the Khugianis walked off with all the grain, leaving us a few empty bags and about 100 maunds scattered over the Fort.

On the 3rd November, General C. Gough marched from Safed Sang with a flying column to open up communication with General Macpherson, who was coming from Kabul; 3 parties of signallers accompanied the force, completely equipped with tents, cooking pots, etc. Having some 10th Hussars signallers with me I formed them into a mounted party, horses being kindly lent me for the purpose by Major Ommaney, Commanding I. A.—R. H. A.

On the 4th, the force halted at Surkpul; the camp was in a hollow and a signal station could not be fixed within a reasonable distance from camp; next day we marched to Jugdulluk, about 4 miles from Surkpul we crossed the Pezwan Kotul, from where we were able to signal straight to Safed Sang. On the 6th, the force marched to Kata Sang, having no connecting links at Pezwan or Jugdulluk Kotul we could no longer keep up communication with Safed Sang. At Kata Sang we met General Macpherson, whose camp was some 5 miles off at Seh Baba in the Tezin valley. On the 7th, the force returned to Jugdulluk, 8th, to Pezwan, and 9th, to Safed Sang. Jugdulluk village, Jugdulluk Kotul and Pezwan were occupied as posts, signallers were stationed at each of these camps and communication kept up daily with head quarters.

On the 22nd of November, proceeded to Darunta from Jelalabad to try and establish communication from the point on Siah Koh range with Captain Straton's post at Lataband; could not reach the point we wanted to, not having sufficient time. By the 25th, Lieutenant Scudamore had re-established the signalling through the Khyber and our line then extended from Junrood to Jugdulluk. The 1-12th being ordered up the line from Lundi Kotul, Lieutenant Scudamore was no longer available as an Assistant Superintendent and his place was taken by Lieutenant Brodie, 2-60th. On the 1st December, Captain Straton took a party of signallers from Jugdulluk Kotul up the Siah Koh hills, and opened up communication with Lataband signal station. Thus we had Heliographic communication between Peshawar and Kabul (190 miles) and this was kept up uninterruptedly to the end of the campaign, with the exception of period from 14th December to 5th January when the Jugdulluk posts were attacked by Asmatoolah Khan, and during the greater part of February when there was too much snow on the ground to allow the signallers proceeding to the station on Siah Koh above Jugdulluk Kotul. Between Peshawar and Kabul we had 25 signalling stations, a great number, but it must be remembered that the principal object of keeping up Heliographic communication along the line, was to help the telegraph by taking off its hands the work from post to post, leaving the telegraph line for through work between Peshawar and Kabul. If necessary we could have gone from Peshawar to Kabul with only four intermediate stations, *i.e.*, Rotas, Lundi Kotul, Siah Koh (Darunta Gorge), and Summach at Lataband; while three more would have taken us on to Ghuzni, *i. e.*, Sher Dawaza, Karogh and Sher Dahan.

During December, when communications were lost with Kabul, and the telegraph line destroyed beyond Pezwan, a great deal of good work was done by the Heliograph; unluckily for us the weather was cloudy

which rendered work slow and uncertain. On the 22nd December, General C. Gough advanced from Jugdulluk on Kabul, and on the 5th January, signalling communication was re-established between Lataband and Jugdulluk; from the 24th, the signallers had been daily up to the Siah Koh station but were unable to attract attention.

During January I obtained leave to go to Kabul to learn the positions of Captain Straton's stations; while he came down the Khyber line as far as Jelalabad to learn mine. It was during this visit that he accompanied a force from Jelalabad towards Girdikus, which was sent out to prevent a party of Mohmuds from crossing the Kabul river in order to join the Shinwarris; from the Ali Boghan hills Captain Straton saw that a large party appeared to be about to cross the river in rear of our troops; he at once signalled this information to head quarters at Jelalabad, guns were sent out and a few rounds dispersed the gathering. If the Mohmuds had been allowed to cross the river, our troops which had worked round to Girdikus would have been cut off from head quarters.

On the 22nd January, the Madras Sappers and Miners were sent with an escort to Darunta gorge, to make a road across the Siah Koh in order that a force might move into the Lughman valley without having to cross the Kabul river, and in order to explore it as a new and more direct route to Kabul. Lieutenant Brodie accompanied the party with signallers, and while there found the point on Siah Koh from which he signalled to Captain Straton's post at Lataband (47 miles); it was an exposed and isolated point but secure enough as long as we had a force in the Lughman valley. Lieutenant Brodie maintained communication between the force in Lughman valley and Jelalabad, from 23rd January up to end of February, while a reconnaissance was made to Mandrawa and while a party was employed at work on the Dobali route, *i. e.* a road over some hills separating Jugdulluk from Lughman valley.

On the redistribution of the forces in Northern Afghanistan, I was transferred to the 2nd Division Kabul Field Force, under General J. Ross at Kabul, Lieutenant Ovens, 34th, taking over from me the Khyber line. At Kabul Captain Straton kept the signallers of the 9th Lancers, 72nd, 92nd and 22nd to work the 1st Division signalling stations, *i. e.*, Sherpur (head quarters of Sir F. Roberts), Bemaru hills, Pei Menar Kotul, and handed over to me signallers of 2/9th, 67th, 65th and a few that I had been allowed to bring on from the Khyber line. My stations were Bala Hissar (head quarters 2nd Division), Siah Sang Fort, and Takt-i-Shah; the two out stations, Butkak and Lataband, we took by alternate months. Between the two divisions we had nearly 80 signallers at work. The country round Kabul was wonderfully well adapted for army signalling, Kabul forming the centre of a large valley surrounded by long ranges of high hills, with lower hills intervening; the Sher Dawaza heights were held by a strong picquet lodged in a block house and formed our best and most convenient station for any signalling.

On the 16th April, General Ross moved into camp with a force composed of General C. Gough's Brigade, 1 squadron 9th Lancers, 3rd Punjab Cavalry, 3rd Bengal Cavalry, 23rd Pioneers, the screw guns and Hazara Mountain Battery, to open up communication with and to carry certain supplies to Sir D. Stewart's force on the march from Kandahar. For this march, 9th Lancers signallers always accompanied the advanced guard and Officer Commanding the advanced guard, dismounted signallers accompanied the main body and rear guard, while two signallers mounted on Yaboos were with me or kept with the Infantry of the advanced guard: besides these two men I had two 9th Lancers signallers with General Ross's personal escort ready for any work that he might require. The first halt was at Kila Kazi, from where we signalled to Kabul through the station on the Sher Dawaza; on the 17th, we marched to Argundi, signalling being maintained with Kabul via: Sher Dawaza and an intermediate station left on the road; on the 18th, to Maidan valley where the force halted for a few days; on the 19th, we tried to open up communication with Kabul from a hill above the Safed Khak Kotul, unluckily we had a cloudy day; at intervals both the Sher Dawaza and ourselves were in sun, but never, at the same time or for any length of time; we sent a few short messages to Sher Dawaza by signalling each word twice and slowly and not waiting for any answer. On the 20th, two parties went out from camp, one under Colonel Norman to Upper Maidan, the other under General C. Gough to a valley west of camp. Communication was kept up with both parties and the camp. On the 21st, the force marched to Kila Durani too far from any hill from which we could fix a station to get Kabul. On the 22nd, camp was moved to Sar-i-top, the road lay up a valley with a very slight ascent and which gradually widened out; when some 4 miles from camp and abreast of the village of Beni Badam we saw straight in front of us and on the horizon the flashing of a Heliograph; knowing that it must come from General Stewart's force, the column was halted and in 2 minutes we were in communication. A reconnoitring party had come out from Ghuzni as far as the Sher Dahan pass, Lieutenant Dickie R. E., Superintendent of Army Signalling, was with the party; he flashed in our direction on the chance of catching us and in 5 minutes he was answered. We had no news of General Stewart since he left Kelat-i-Ghilzi, so the interest excited may be imagined, especially when we heard there had been a fight at Ahmed Keyl. During the day we took the following message which was sent on to Kabul by runners:—

"Camp, Ghuzni, 22nd April.

From General Stewart.

To General Roberts.

On the 19th instant the division under my command, while marching from Musbaki, encountered an armed gathering of Andaris, Tarakis, Suliman Kheylys, and other tribesmen, who numbered some 15,000 men horse and foot. Preparations were made to attack strong position held by the enemy twenty three miles south of Ghuzni, when a body of some 3,000 fanatic swordsmen poured down on our troops, spreading out beyond either flank of our line: fighting lasted for one hour, after which

the entire body of the enemy spread broadcast over the country. The protection of the baggage prevented pursuit by the cavalry: the Division, however, marched forward nine miles after the engagement to Nani, and the day before yesterday, the 20th, the troops entered Ghuzni. Over 1,000 of the enemy dead were counted on the ground, and their loss in killed and wounded is stated to be 2,000; the casualties on our side were 17 killed and 115 wounded.

The following are the wounded: Lieutenant Young 19th B. L. dangerously; Captain Corbett R. H. A. severely; Lieutenant Colonel Lawson 59th, Yorke 19th B. L., Lieutenant Watson 59th, Lieutenant Stewart, 2nd P. C., slightly. No officers killed. All wounded doing well. During march from Khelat-i-Ghilzi the procuring of necessary supplies has been rendered very difficult by the desertion of entire country. Troops, however, in good health. Horses and cattle in capital condition. I propose halting for two days and march towards Shekabad on 24th. The gathering encountered on 19th had been marching parallel to line of advance during some days previously, having been principally near Shahjni. No farther difficulty regarding supplies anticipated. Repeat to Military, Chief, and Secretary of State."

This message consisted of 238 words and I give it here as a specimen of what was and can be done by the Heliograph; the light was a very bad one, being on a hazy sky line, 40 miles distant, and it was rendered all the harder to read by the inferior description of our telescopes. I once had a message handed in and sent which consisted of 535 words; it was from a Press correspondent. After this all such messages were limited to 100 words; only one could be sent in 24 hours by the same person and the message had to be countersigned by the Staff Officer of the Station.

If, at this time, we could have had a signalling station on Karogh Hill, we should have had communication between Ghuzni, General Ross at Shekabad, and Kabul. General Ross asked for a party to be sent to Karogh and Captain Straton also reported it to head quarters; circumstances at Kabul prevented the necessary escort from being sent out and so we lost what would have been a real signalling triumph. On the 24th, part of the Ghuzni column were engaged with Muski Alam's force some 6 miles south east of Ghuzni, some very useful signalling being carried out by Lieutenant Dickie. On the 24th, 25th, 26th, 27th, General Ross's column halted at Saidabad; we kept up communication through a party at Sher Dahan while General Stewart's Division was marching towards us, and on the 25th and 26th, we had skirmishes with some tribesmen who had collected on, and had to be driven off, hills to the south west of camp; I had signallers out with various parties, but not much work was done as both days it clouded over and we had to take to the flag. I saw on these days how useful signalling would be to a mountain battery, for should there happen to be, as on those days, flanking parties to batteries, signallers with these parties could inform the battery whether their elevation was correct, etc.

On the 28th, Sir Donald Stewart joined our column, and our camp was moved to Shekabad; on the 29th, General Ross's force marched to

Sar-i-top, General Gough making a diversion into the Lungar Valley to blow up Forts of Abdool Guffoor; during the day General Ross and General Gough's force were in communication. On the 30th, we marched to Maidan Valley; 1st May, to Gholam Hyder's Fort; and 2nd, reached Kabul; the Ghuzni division moving into the Logar Valley.

On the 8th May, a force of the 1st Division under Sir F. Roberts moved into camp, Captain Straton went out in charge of the signallers; from the 9th to 15th, we kept up communication with Captain Straton in the Logar Valley, and on the 16th, opened up with Lieutenant Dickie, 3rd Division, at Hisarah, 37 miles range from the Takt-i-shah; except for a few days, when the haze in the Logar Valley was too great, we kept up communication with the 3rd Division, while it remained at Hisarah, and also with Brigades marching from the 3rd Division to Kabul and from Kabul to the 3rd Division; on the 24th, opened up with General Robert's column which had worked round into the Maidan Valley; this was also kept up until the column returned to Kabul on 8th June.

During June and July we had a permanent party of 12 signallers on the Sher Dawaza; they were lodged in a block house with a guard of Ghorkhas, and the amount of work done did them the greatest credit; during the greater part of the time they worked with as many as 6 stations, messages averaged 90 a day and one day numbered as many as 122. They worked with the 3rd Division at Hisarah from the 16th May to 8th August; with detached parties from this Division going to and from Kabul; with a 1st Division force from 8th May to 8th June; with General C. Gough's brigade, from June 17th to August 4th, when working along the lower slopes of Pugman mountains, from Kila Kazi to Kila Hajie; and with General Macpherson's brigade, which was encamped in the Chardeh Valley, from 15th to 30th July; signallers too invariably accompanied reconnoissances and all survey parties; on the 23rd June, Captain Straton and signallers accompanied Major Woodthorpe's survey party when he reached No. 5 Pugman, a Peak on the Pugman range some 15,000 feet high.

During this period there were 100 signallers at work daily with the three divisions round Kabul, and there must have been some 100 more along the Khyber Line.

On the 5th August, the three divisions were concentrated round Kabul; during the next three days the divisions were re-arranged, and on the 8th, General Roberts moved towards Ghuzni; on the 9th, we signalled to his force at Zaidabad and Munsai in the Logar Valley, and on the 10th, with him at Zarghanshur and Wozir Killa; at sunset the signallers were withdrawn from the Sher Dawaza, having previously wished goodbye and goodluck to dear old Straton, little dreaming that we had seen the last of our chief of signallers and best of friends; he never spared himself when hard work was to be done, and if heliographic communication was possible he did it, no matter what difficulties existed or how hard the climb.

On the 11th August, the troops evacuated Kabul and marched to Butkak, Abdur Rahman being received by Sir Donald Stewart outside

Sherpur previous to our departure. Signallers were attached to the different rear guards, etc. but there was no work for them. For the return march Lieutenant Dickie acted as Superintendent of Army Signalling under General Hills, who was in command of the troops. Lieutenant Govan 2/9th took charge of the signallers with General Gough's Brigade on the rear guard; he had previously acted as my Assistant, when the Brigade was in camp near Kabul; I was attached to head quarters with general supervision. The telegraph line was rolled up one day in advance of the rear guard and its place taken by the Heliograph. On the 12th, the force marched to Lataband and on the 13th, to Seh Baba, crossing the Kotul by two roads. We had two parties of signallers at the points where the road crossed the Kotul, they were able to signal to each other and to the rear guard which had to halt at Lataband to allow all the baggage to get well over the Kotul. On the 14th, General Gough's brigade halted at Seh Baba, the remainder marched to Jugdulluk; on the 15th, General Daunt's brigade halted, General Hughes and head quarters marched to Pezwan, General Gough, to Jugdulluk; on the 16th, General Hughes and head quarters to Safed Sang, General Daunt to Pezwan, and on the 18th, all troops had reached Safed Sang. On the 19th head quarters left Safed Sang and reached Peshawur; on the 30th, troops from Safed Sang to Lundi Khana, marching in parties of two Regiments, or Battery and a Regiment, and again splitting up into smaller parties through the Khyber.

From Judulluk, Lieutenant Ovens took up the signalling, his men were left at their several stations with their carriage, etc., and were rolled up by the rear guard. The stations along the line were the same as when handed over in March; Barikab had been given up as the road had been changed to the river route by Girdikus, this necessitated two new signal stations at the posts Lachipur and Chardeh.

At Lundi Kotul the position of the camp station had been altered to a hill nearer the ridge as the camp had been concentrated in that direction. At all the posts in the Khyber the signallers were in strong block houses on posts and signalling was carried on by day and night.

Since the Afghan campaign we have had the Mahsud Waziri expedition; Lieutenant Blunt R.E., Instructor of Army Signalling in Bengal, was in charge of the signallers; he joined at Dera Ismail Khan on 31st March, and found that it had been decided that no British signallers were to accompany the force; any signalling required was to be carried on by officers and some 20 signallers who had been regimentally instructed. When the force advanced into Waziri country there was no line of communication kept up and so work was confined to signalling on the line of march and with Shekh Budin where Lieut. Mealy, 1st Punjab Cavalry and 4 sepoy signallers were on the look out. Lieut. Blunt accompanied General Kennedy's column and worked with Shekh Budin; from Tank, Zam, Kot Khirzi, Jundoola (40 miles), Hydurri Kuch (from summit of Kun Goverdi, 46 miles), and from the summit of Pir Ghul (11,000'), a distance of 67 miles, the longest distance that we have yet used in war; the Heliograph was a 12", but the sky was not very

favorable and there was a haze over Shekh Budin, the signals being only readable with glasses; Lieut. Mealy being able, at times, to read Lieutenant Blunt's lights without glasses.

From Makim communication was established with General Gordon at Zazmak; on the return march the haze over Shekh Budin was so great that signalling could not be established. Besides signalling to Lieut. Blunt, Lieut. Mealy signalled to General Gordon at Meerean and Speenwoom with Bannu and Dera Ismail Khan, the latter distant 33 miles from Shekh Budin. From the reports of these officers, the sepoy signallers seem to have worked well but failed through not having a sufficient knowledge of the language; they were good readers but indifferent receivers, Lieutenant Blunt reporting that the only way to ensure accuracy was to have each word repeated by the receiving station. Both officers agree that should sepoy signallers be employed, a European should invariably be placed in charge of a station. During the Afghan campaign Lieutenant Dickie had in regular employ 5 men of the 3rd Goorkhas who worked well and were a valuable addition to his signalling staff. Captain Straton had several classes of sepoys at Kabul, those of the 23rd Pioneers being very good. Lieutenant Spragge trained some men of the 13th Bengal Lancers and I had a class of some 12 men of the 4th Goorkhas, some 6 of whom promised to be as good as most Europeans, and one, I believe, is now a trained telegraph signaler. Should signalling ever be introduced into the Native Army I trust that our English system will be strictly adhered to, and that no such thing as private regimental systems will be allowed; native signallers will, I am sure, be often of the greatest assistance, but in order that such may be the case, their instruction must be the same as Europeans and they should be accustomed to work with Europeans.

Our regiments, that went from India to the Cape, have been doing valuable signalling work in Natal and the Transvaal. Thinking it may prove of some interest to the present company I attach an extract from the R. E. Journal.

"General Colley decided that the general supervision was to form part of the duties of Major T. Fraser, R.E., as Intelligence Officer of the Quartermaster General's branch, and Major Wynne, 50th Regiment (brother of the late Captain Warren Wynne, R.E.), and Lieut. Davidson, 2/60th Rifles, did the work under Major Fraser.

The longest distance between two stations was 65 miles, but this was rarely possible. Grass fires were a constant source of inconvenience, and the weather was far from perfect, in a heliographic sense, even in winter, while in summer (the wet season), fine days were the exception and bad weather the rule.

Major Wynne and Lieut. Davidson carried the business through in spite of much difficulty. During the war, the chief operation was to communicate with our posts on the line from Ladysmith to Newcastle, where there were no telegraph officers and where malevolent neutrals of the Orange Free State assumed a threatening attitude. After the war, 90 miles of the Newcastle-Pretoria telegraph line being down, and

as the Boers resisted repairs, heliography was substituted for telegraphy, and the weather improving, was successful.

The chief lesson learnt, is the necessity for training battalions in England in heliography with a view to possible foreign service. But for the accident of there being in Natal, an Indian Brigade trained in heliography, great difficulty would have been experienced.

Flag signalling was used at Majuba, and by means of it, the Newcastle reinforcements were ordered up, unfortunately too late for use.

The Boers used small flags to signal, but it has not been ascertained that they worked by any code."

The Army and Navy Gazette too publishes a paragraph which shows that the Russians in Central Asia have found out the utility of our heliographs.

"General Skobelev reported very favourably of the heliographs obtained from England, which he states in his despatches have rendered immense service during the campaign. In particular did they prove of value on the day of the storming of Geok Tepe, the heliograph signallers on the summit of the Kopet Dagh cliff (3,000 feet high), alongside the captured aoul, being able to afford the cavalry guidance as to the route of pursuit to take after the Tekke fugitives streaming across the oasis to the desert. "For campaigns against desert tribes," says General Skobelev, "the heliograph is invaluable. Telegraph wires are a great trouble to fix and may be cut at any moment. The heliograph service, however, can be established as fast as horsemen can ride in any direction; it can be withdrawn and disestablished at a second's notice; it requires no specialists in the shape of artisans or clerks, but can be carried on by ordinary soldiers, who also can form part of the fighting force; and it adds nothing to the transport train,—itself a recommendation, where transport is enormously difficult." General Skobelev found that the irregular cavalry rapidly learnt the use of the instrument, and took great pride in being correct. The Tekke Turcomans, at the same time, were struck with astonishment at the facility with which messages could be transmitted from one point to another by flashes."

In the United States of America, there is, I believe, a corps of signallers thoroughly trained in army signalling; and for the thorough efficiency of army signalling in India, I feel sure that some such similar corps would be the best in every way; as such a corps will, I fear, never be sanctioned, our great aim must be to organize our signallers on service so as to make them, for the time being, as much like a corps as possible; detached entirely from regiments, complete with their own transport, camp equipage, native establishment, signalling apparatus, etc., and commanded by officers to whom they ought to look to in all matters of pay, discipline, advancement, etc. This was the system along the Khyber Line and almost all signalling officers in Northern Afghanistan deemed it the right one. In Southern Afghanistan, and with the division that marched from Kandahar to Kabul, it was different; signallers were kept with their regiments under Brigade signalling

Organization of signallers in war.

officers, their services only available when asked for by the signalling officers. Such a system will work very well when the division is concentrated or split up into brigades, but I cannot see how it would work along a line of communication, with regiments often changing, being pushed on to the front, or forming part of flying columns.

The Officers then to be permanently attached to this corps of signallers, should be a Superintendent and one Assistant, the signallers should be from regiments that are not likely to take the Field, and they should be in the proportion of 16 to each Brigade, Cavalry or Infantry, with an extra 16 to be attached to the head quarters of the Division. The regiments then, which formed part of the force, would have these signallers available for any regimental signalling work, while at the same time they would be available in case of their services being urgently required by the Superintendent when Brigades became detached. The Instructor of Army Signalling of one of the regiments of that Brigade would superintend the signalling under orders of the Superintendent, and during the time employed would receive the pay of an Assistant. The Superintendent should have the powers of an officer commanding a wing or detachment, and be able to give Lance rank if necessary; he should be given a steady non-commissioned officer to act as Sergeant Major and Quarter Master Signaller for the purpose of keeping up all rosters and details; and to the corps or detachment should be attached a sharp native mistri for petty repairs to instruments, with a few kalassies to take charge of all spare stores.

The signallers of the corps should be divided into groups or units of 4 each, and each of these groups should be complete in itself, with its own transport, tents, servants, etc. The Head Quarters manual lays down 3 men as sufficient for a terminal station, but we found 4 a better number as it allowed for casualties and let one man be off duty at the time to attend to the cooking, camp, etc.

As the principal duty of signallers is to transmit information, it seems advisable that signallers should be armed

Arms.

with the Martini-Heury carbine, which would be carried slung across the back and would be sufficient for all practical purposes; the number of rounds carried might be reduced from 70 to 40 so as to facilitate hill climbing and to compensate for the extra weight of the signalling equipment. Captain Begbie of the Madras Sappers and Miners goes so far as to recommend that signallers should only be armed with Revolvers, but this is, I think, going too far, as signalling posts have several times been attacked and every available rifleman was wanted, *viz*: Tarkai Hill, Ali Boghan, Fort Battye, Jugdulluk Kotul, and once the signallers were fired at when going up hill at Lataband.

The discipline of the corps should be entirely in the hands of the Superintendent who should be vested with the powers of an officer commanding a wing or detachment, as well as being able to confer temporary rank; minor offences should be met with the forfeiture of working pay, or a reduction to a lower rate of working pay; serious misconduct by remanding the men to their regiments. When detached from the Superintendent or his

Discipline.

Assistant, the signallers would be under the Brigade Major or station staff officer, or, at small posts, under the officer commanding the post, all irregularities being reported to the Superintendent or his Assistant.

Our instructions were that rations for signallers were to be obtained direct from the commissariat, but this we were seldom able to do. At stations where there were large commissariat depots, the commissariat seldom had any thing to do with petty issues (keeping no establishment for that purpose), and the indents were passed on to the gomashtha of some European Regiment or Battery for compliance, the consequence was that it was simpler to get the signallers attached to regiments for rations. At small stations we sometimes got rations direct from the commissariat. Government sanctioned the entertainment of cooks at the various signalling stations along the Khyber Line, a great boon, as it gave us all the signallers for work and saved small accounts. Sometimes, after men had been attached to regiments, I received all sorts of odd charges for cooking, and recovering these small sums gave extra work. Regiments generally took care to make the men pay up before they left, but this was not always possible as sometimes signallers had to be removed at very short notice to start new stations or supply casualties at other stations. The large use of preserved meats was a great help to us in rationing small parties for 3 or 4 days at a time. The Telegraph Department give compensation to military signallers in lieu of rations when not procurable; the Superintendent of Army signalling should also have this power, to be used with discretion.

During the Afghan campaign our principal instrument was the 4½" Roorkee pattern Heliograph on a single stand; it was an easy instrument to work but was not quite strongly enough put together for the rough and continuous work of service, the mirror too had to be cut to be put in its place and it had other slight defects; it was packed in a wooden box, a clumsy arrangement and condemned by every one, only convenient as a seat for the signallers; improvements have now been made and a really serviceable Heliograph is being got out.

Last October (1880) a special committee was assembled at Rawul Pindi, under Lieutenant Colonel Chaplin V. C. as president, to report on signalling equipment for Field service; as I was a member of the committee and as the proceedings have not yet been published, I am unable to add any remarks as to the actual equipment of signallers on active service.

The Lime light as used at home and described in the Horse Guards Manual, was not used in Afghanistan, as far as I know; in its present form it is troublesome to prepare and to carry, and is not adapted for Field work. Begbie's lamps were used with very good results, as far as distance was concerned, but they are not carefully enough made for service; the cases of the lamps are very liable to get broken, and they are clumsy to carry; the A and B patterns are on the Lens principle; the C pattern, is a parabolic

reflector; the lamps themselves are merely Kerosine oil lamps with circular wicks, while the cases are of tin fitted with a shutter apparatus worked by a lever.

I think it is a great pity that more attention is not given to night signalling. India is a country eminently suited for it; as a rule the nights are clear, bright and free from mist, and if good instruments could be obtained our signallers might be saved a great deal of exposure in the hot weather; one great argument against using lamps was that many of our stations along the Khyber Line were only occupied during the day time, *i. e.* Lataband hill above Jugdulluk Kotul, Pezwan Kotul, Ali Boghan hills, etc, and it would have taken more signallers and extra guards to have worked these stations by night as well as by day. Through the Khyber Pass defensible signalling posts, night signalling with Begbie's lamps was kept up, as also between some of the advanced posts when the stations were in camp. The greatest distance I have used the lamps was from Safed Sang to Jelalabad, 25 miles; the light could be seen with the naked eye but had to be read with Field glasses. Heliography, or signalling by moonlight, with the heliograph has often been used up to a distance of 12 miles; while during the siege of Sherpur Heliographs were used to reflect the light of the lamp and night signalling was carried on in this manner.

At the commencement of the Afghan campaign signallers received no remuneration for their extra skilled labor, nor was there any staff salary laid down for a Superintendent of Army Signalling; a Superintendent of Field Telegraph drew Rs. 250/. staff per mensem. During the campaign, staff pay was sanctioned for a Superintendent and Assistant Superintendent of Army Signalling at the rates of 240/. and 112/. + 30/. horse allowance; *i. e.*, the same as that of a Field and Assistant Field Engineer. The general officer commanding a division in the Field was also empowered to make temporary appointments of Assistant Superintendent when it was deemed necessary. Signallers were also granted working pay at the rate of 8 annas for a non-commissioned-officer and 6 annas a day for a private; this was a great boon and tended greatly to the efficiency of army signalling. It would be better to give soldiers working pay according to their skill in signalling, say Rs. 15 and Rs. 10 a month, the class to be fixed by the Superintendent; this would encourage men to work in order to get on the extra rate and to keep the extra rate when once obtained; the non-commissioned officer in charge of a party or station also to receive a small extra rate of pay. During the campaign I drew working pay of the signallers monthly on the authority of a division order and disbursed it direct to the men, sending the accounts with vouchers direct to the circle Paymaster at Rawul Pindi for audit. When once started there was never any difficulty about the adjustment of these accounts and the signallers liked receiving the pay as soon as it was earned. I encouraged the men to allow their regimental pay to accumulate at their own regimental head quarters; those who wanted any, I advanced it in small sums recovering the several amounts from

the Paymasters of regiments through a bank in India ; this was infinitely less trouble than having the regimental pay of the men sent to me from all parts of India by Remittance Transfer Receipts on all sorts of Treasuries, especially as very often the men did not want the money and I only had to return it.

Almost all signalling officers will agree with me when I say the
 Telescopes. Telescope is a most important adjunct to army signalling and that we want the very best that

can be given us, compatible only with size and weight : we want it not only to read signals with but to watch troops and to search for stations ; the present regulation telescope is quite useless for work in India and is very little better than a Field glass ; telescopes too ought to have a very firm double tripod stand. It is tiring work reading through a telescope for any length of time and especially so if there is not a good steady rest. Training a signaller to use a telescope with as little inconvenience to himself as possible is an important part of the instruction and takes both time and practice. One eye should never be jammed tight against the eye piece and the other shut, but after the telescope has been carefully focused and laid on the distant station, the reader should carry his head back until his eye is 3" from the eye piece, then gradually opening his other eye he will be able to distinguish plainly the object he wishes to watch. Signallers should be practised in reading with either eye so that the strain may not always be on one.

The greatest enemy to signalling in India is the sun haze, which the telescope only magnifies but does not penetrate, a faint light on account of thin clouds is a different thing, the telescope can penetrate the one but not the other.

On service it is most necessary to establish some system for checking messages ; each station ought to have a
 Books and Messages. register book in which the addresses of all messages are recorded with time of receipt or despatch, senders or receivers name, etc ; the original messages being sent daily or weekly to the Superintendent or whoever he may appoint for that purpose ; messages ought always to be signed by the sender ; if press or private, to be countersigned by a staff officer ; messages ought to be delivered in envelopes, signed by the receiver and returned to the signal station. Signallers ought to be punished for making known the contents of any messages that pass through their stations, they ought never to be allowed to deliver their own messages, and if orderlies cannot be spared for that purpose a staff of kahars ought to be permanently attached to each signalling station. The best pattern of message book is that similar to one in use, for field service, by the Telegraph Department ; with slight alterations it is well suited to army signalling.

The principal uses of army signalling in war are :—to facilitate communication along a line of march, as a medium for communicating orders to reconnoitring or detached parties ; to keep up communication between camps or along a line of posts before the telegraph line is laid, and after it is laid to aid it, or to keep up communication should the line be cut by the enemy.

General Remarks.

The Heliograph has often been compared with the telegraph, but it is unfair to do so, as it does not attempt to compete with it; it can aid it by taking a lot of work off its hands, and it can be used with little or no cost where the telegraph often cannot be, such as in rapid frontier expeditions when communications are not kept up and when it is not worth while to lay a semi-permanent telegraph line.

The Heliograph and the telegraph are intimately connected and neither can take the place of the other; in Afghanistan we had at times the Heliograph, the Sappers and Miners' Field telegraph line, and the Government semi-permanent line, all working together, but I have omitted the two latter from this paper as I have not the records to refer to nor space sufficient to attempt to give an account of the working of all three.

The great advantages of a Heliograph are its great range, small cost, portability, ease with which communication can be established and maintained, rapidity of work compared with any other signalling apparatus. The Heliograph of course is useless without the sun, and is, in consequence, liable to interruption by cloudy days; still this is better than having no communication at all, and we must put up with this disadvantage until we can get some artificial light to take the place of the sun.* It is, however, an error to have signalling stations too far apart and to trust to the Heliograph as our sole means of communication: the distances apart of our signalling stations ought to be such that, should the sun become obscured, signalling could be carried on by some other means, but in order to do this we must have better telescopes.

The longest distances signalled by the Heliograph on service are with 12" mirror in Waziri expedition from Thekh Budin to Pir Ghul mountain, 67 miles; with 5" mirror, Thull to the Peiwar, 58 miles; with 3" Takt-i-shah to Hisaiak, 36 miles; the distances are taken in a straight line from station to station. I have signalled with Begbie's pattern lamp from Safed Sang to Jelalabad, 25 miles, while Captain Begbie reports that a 4' flag was seen at Mundidroog from Bangalore a distance of 26 miles. It was seen through one of Cookes' telescopes but it was not possible to read the signals. The best day for a flag is the worst for a Heliograph; a bright sunny day is wanted for the latter while a dark cloudy day with a clear atmosphere is the best for a flag.

The flash from a mirror is a cone of light increasing with the distance.

Theoretically it has been shewn that for every 107 yards of distance, the diameter of a flash from a plane mirror is increased by one yard, thus at 1 mile the diameter of the flash is 17 yards, at 5 miles 85 yards; but practically the flash is visible over a greater area than this

* So important is the Heliograph as a signalling instrument in India, that without it, no signal operations of much value can be well carried out; the distances from camp to camp are, with our present telescopes, too great for flags, and if intermediate parties have to be put out, extra guards and signallers are entailed, and it then becomes a question whether some other method of communication be not better.

especially at short ranges; this is due perhaps to our mirrors not being perfect planes, in which case several cones of light are reflected. To get the best light our mirrors ought to be as perfect planes as possible, and they ought to be of the same thickness, otherwise we get another cause of eccentricity.

The rate of signalling with a flag may be taken at 5 ordinary words, averaging 5 letters, a minute; at 6 to 8 words a minute for a Begbie's lamp; and 10 or 12 for a Heliograph, but it is hard to keep up these rates for any length of time.

Major Le Mesurier, late Deputy Assistant Quarter Master General for Signalling at home, states that a signaller with a small flag can work at the rate of 8 or 9 words a minute, and gives the advantage to signalling over mounted orderlies, at any distances beyond a flat mile gallop, even for a single message.*

At Kabul noonday time was signalled from Sherpur to the stations round. About 11-45 A.M. daily, and at a signal from Sherpur head quarters, all signal stations ceased work and kept a look out; at 5 minutes to 12 a signaller standing by the Sherpur gun sent the word "time" to the head quarters station, which was immediately signalled on to the other stations; at 1 minute to 12 the signaller at the gun commenced the preparative sign, keeping it up for 30 seconds when he held a steady light and dropped it as the word fire was given by the gunner in charge.

The fact that the flag is the principal means of signalling in England and the Heliograph in India, renders the Horse Guards Manual difficult to adopt in this country, and it has been very rightly suggested by Lieutenant Blunt, R. E., Instructor of Army Signalling in Bengal, that there should be an addendum to the Manual for India. Take for instance the General Answer, which is a succession of long and short flashes, kept up until the next word is commenced. The signaller at the Heliograph goes hammering away at his instrument as hard as he can go, wearing it out and sometimes causing it to lose alignment; it would be much better to give one long steady flash by simply pressing down the key; this would be easily distinguished from the call for light, which is a long flash preceded by several short. Again, our system of asking for "repeats" is better adapted to India than the English system. The station, P. A. has received a message from P. B., which he thinks correct and wants no repeats, he shows a light on P. A. which P. B. answers back; P. A. then gives R. T. which is answered by R. T. from P. B. and the next message is proceeded with. If P. A. is uncertain as to the correctness of the message received from P. B., he calls for light from P. B. and then signals "Repeat after

* Signallers eyes sometimes suffer from the glare; reading through Field glasses or colored spectacles saves them a good deal, but if a man's eyes are inclined to suffer he ought to be taken off work at once. Captain Bishop, 3rd Goorkhas, has suggested a means of getting rid of the glare by placing an ordinary looking glass in a dark tent, leaving a gap open so as to admit the reflection of the opposite station in the looking glass, the reader can then sit with his back to the light and read from the looking glass.

such and such a word," P. B. complies until he gets the signal "stop," when R. Ts. as before are exchanged.

In the English method, the message book is ruled and divided into spaces, each partition being represented by certain letters; if the receiver is uncertain about any word he signals repeat such and such a word, as represented by the letters; this has to be done for each word that the receiver is uncertain about; it may answer for short messages but hardly can when such messages as the one I have quoted from Sir Donald Stewart to Sir F. Roberts are received.

The last edition too of the Horse Guards Manual authorizes certain abbreviations which I do not think are desirable; for instance *a e r*, represents appear;—s—ing—ed—ance—ence—ances; the abbreviations have been constructed so as to retain a resemblance to the words which they represent; they are printed on cards and folded in the same size as the pages of the message book; the manual also says that signal men who constantly use them will retain most of them in their memory and will seldom have to refer to the list; some may, but others will only guess at the abbreviations and I think it a pity they have been adopted; by all means let us have such abbreviations as A. A. G.; C. O. Comst., U. R., etc, but let us have none from which the smallest error can accrue. In India the Telegraph and Heliograph will almost always work together, let us adopt their abbreviations and assimilate our system to theirs, but start none of our own; above all stop all regimental systems and let us have the Morse Alphabet or nothing.

This year at Aldershot, Lieut. du Boulay, 7th Dragoon Guards, signalling officer to the Cavalry Brigade at Aldershot, has drawn up some standing orders and signalling abbreviations for the various words of command made use of in cavalry brigade movements; I regret that I know little or nothing about cavalry movements and in consequence do not like to criticize; great care and most perfect accuracy must be required, for wrong orders given to cavalry are not easily corrected and may lead to disastrous results.

Sufficient care is not always taken by the commanding officers of regiments in the men chosen to go through a course of army signalling; a man to be a good signaller ought to have at least a 2nd class certificate of education, be able to write a good clear hand, spell correctly, be intelligent, active, a good walker, and have a good eye for country. Signallers are so often left by themselves and have to act on their own responsibility that the best men ought to be chosen, officers cannot be in charge of every station, and I do not think it is always necessary that they should be; let the officer start the station but let the senior signaller be responsible for the correct working of that station. Unfortunately the men that we most want are just those whom commanding officers require for non-commissioned officers and hence our difficulty in getting good men is that we have to compete against regimental promotion; we may be able to do this on service but there is no inducement in peace time.

It is a mistake to think that 30 working days of the instruction course is sufficient to make a man a good signaller: as a rule you may

calculate on its being 3 months before a man becomes a really good hand, capable of taking his place anywhere; after the course of instruction signallers ought to be kept regularly at work with their regiments for 2 months.

The established proportion of Heliographs with a regiment ought to be 4 and not 2, so that signallers may be practised to work through an intermediate station without losing time; at present with only two regiments they can do nothing but send and receive.

In the earlier days of the Afghan campaign, and in Jowaki, the Organization of signal- want of a sufficient number of really well lers in times of peace. trained signallers was much felt, and those of us were lucky who obtained signallers from regiments quartered in the Murree Hills or Peshawar Valley, in which districts the Heliograph is greatly used. Having had signallers from 21 different regiments and nearly 200 in number, at various times, under me, I have seen how seldom it is that signallers are really trained up to the work required in a campaign, and how they vary in different regiments as to the numbers taught and to efficiency. In order, therefore, that the training of signallers in times of peace should be more thorough and uniform I would beg to add the following.

At present there is an Instructor in Army Signalling and Telegraphy at Roorkee, Kirkee and Bangalore, the head-quarters of the three corps of Sappers and Miners. Men from various regiments are carefully instructed by these officers, and at the end of a course of 30 working days, return to their regiments fair signallers and with certificates qualifying them to act as Assistant Instructors in army signalling. If it so happens that there is an officer in the regiment who takes an interest in the work, the men keep up their signalling, become first-rate hands and are ready at any time for service in the field. On the other hand, if there be no officer who cares for it, owing perhaps to the regiment being in some station in the plains where the utility of army signalling is not fully recognized, the men very soon forget all they have learnt, and when their services are urgently required, they are comparatively useless and have to be taught all over again. As an instance of this, men were sent up to me as qualified signallers, but some were so ignorant that they had forgotten how to set up a heliograph, and some had never done a day's work since they went through the course, perhaps a year before.

Not only is it essential that signallers who are about to take the field should be well instructed and in practice, but men of the various regiments in a district should be accustomed to work together; and the officer to whom the superintendence of army signalling is entrusted should know something of the characters and signalling qualifications of the men that are likely to be under him. Without some such knowledge, all the best signallers may be collected at one station and the bad at another, and so the signalling along a whole line ruined. This is a knowledge that can, after a short time, be easily acquired, but then it is at the outset of a campaign that army signalling is of

most use, not when the line is well established. At present there is no system in India by which army signalling can be kept up and men regularly brought together for practice.

Then as regards signalling stores during the campaign, instruments were received—(1) direct from the makers by orders of Quarter Master General; (2) from arsenals; and (3) from regiments. Those received direct from makers were good, but there was delay in getting them up-country; those from regiments were in good working order, but this was hardly a fair source of supply, for taking away the instruments stopped all regimental instruction, or if the regiment was in the field, stopped all work the regiment wished to carry on independently. With regard to those received from arsenals, my experience is that they have nearly always been bad and of all sorts of patterns, Heliostats being issued instead of Heliographs and old pattern hand lamps instead of the new ones. Instruments too have been received with mirrors so bad that they were useless, and many were deficient of screws, &c.

Instruments, however, are not the only things to render signallers fit for the field; good carriage, tents, stationery, cooking pots, buckets, &c., are all required, and the difficulty of getting these when in the field is by no means a small one.*

As before stated, the instruction of men in army signalling is provided for in India, but, unless a regiment happens to be quartered in or near a hill station, there is no means or system by which men can keep up the knowledge acquired during their instructional course. Recent orders have been issued, instructing officers of the Quarter Master General's Department to inspect the various regiments of their divisions and districts, and report on their efficiency as regards army signalling. With regard to this I would respectfully beg to remark that if the Assistant Quarter Master General be well up in army signalling, this can be carried out satisfactorily, but not all have passed through the course of instruction and fewer have kept up the knowledge then acquired. A more detailed report is required than to know how many men are instructed, and how many days a month men work. Some record ought to be kept from which it can be seen where the best signallers are, and from which regiment they can be easiest obtained. These inspections ought, I think, to be made by qualified signalling officers, and the instruction and inspections brought under one head.

Thus, there being no recognized system by which men of *all* regiments can keep the knowledge acquired during their instructional courses, I would suggest the following, by which army signalling in India might, I think, be rendered more generally efficient, and by means of which signallers could be sent off at the shortest notice, completely equipped, to any part of India. Parties of signallers to be really effective ought to be complete in themselves long before they cross the frontier.

* A difficulty that will not occur again as I hope all these various stores will be recognized as necessities and the supply sanctioned.

I would propose that India be divided into four districts.—

- | | |
|----------------------------------|-----------------------------|
| 1. Punjab, | Head-quarters, Rawal Pindi. |
| 2. N. W. Provinces and Bengal, | „ Lucknow. |
| 3. Bombay and Central Provinces, | „ Kirkee. |
| 4. Madras and Burmah, | „ Bangalore. |

All army signalling, instructional or otherwise, in these districts, to be under a Deputy Assistant Quarter Master General, who would carry out all instruction in army signalling in his district, make periodical inspections of regiments and keep up at his head-quarters supplies of all signalling stores, both instruments and tents, &c., so that they would be available for instructional purposes, or for issue in case of active service. With very little trouble and cost to Government, a certain number of sets of equipment might be maintained complete, with tent, mule trunks, heliographs, lamps, telescopes, &c., for parties of four men each. The actual cost of signalling apparatus being so small, this would entail very little expense to Government, for instead of the stores being kept in arsenals they would be in hands of officers who would look after them and whose interest it was to keep them in thorough repair.

A non-commissioned officer would be attached to each head-quarters to act as Assistant Instructor and to help to keep the records. A small native establishment of a store-keeper and chowkidar would also be required, but the expense so entailed would be very trifling.

Then I would propose that every regiment in India should keep up 16 signallers, *i. e.*, 4 parties of four, and these 4 parties should have issued to them 4 complete sets of signalling equipment.

During the cold season the Deputy Assistant Quarter Master General for Signalling would make inspections of regiments in his districts, thus finding out if the proper number of men were kept up to the work. A report to the Quarter Master General would be furnished by the 1st April of each year.

From the 15th April, until the commencement of the rains, time would be given up to the instruction of officers and to men required to complete the complement of 16 with every regiment. Then from the end of the rains until the 15th October, practical classes would be formed of qualified signallers, parties of four being sent out in various directions completely equipped as on active service. I am sure some such instruction would be invaluable, and the different regiments of a district would be brought together and so get accustomed to work together; a great thing, for it is most important to have only one system of work.

These instructional classes would be formed (in Bengal Presidency) at Murree and Naini Tal, and I know no two stations better adapted to army signalling. Murree, with its hutted and health camps, is wonderfully suited; Naini Tal, too, with the various points round the lake, and with Ranikhet and Almora near at hand, is a first-rate place. If it be thought desirable to have more classes during the cold season, Rawal Pindi, with undulating hills round, is very well adapted,

and so is Lucknow with such points as the double-storied barracks, Emambara (in Muchee Bhawan Fort), and the towers of the Residency and Alumbagh.

The system would tend to establish army signalling more equally over India, for advantage would be taken to employ it, whenever possible, between regiments in camp (for musketry or cholera) and head-quarters, or to keep up communication between such places as Peshawur and its outposts, Nowshera and Cherat, Lucknow Cantonments and Muchee Bhawan Fort, Allahabad Fort and Cantonments, &c. I believe there are few stations in India where, if a little trouble be taken, army signalling might not be made use of.

The cost of this to Government would, as I have said, be very little for instruments, &c., while there would be in India four officers acting as Instructor instead of three as at present. This would not be a heavy item, and considering the number of troops quartered in the Bengal Presidency, two Instructors would not be at all too many, particularly as they would take off the hands of the Quarter Master General's Department the extra duty of inspections of regiment in army signalling.

With the Telegraph Company of Bengal Sappers and Miners we have a splendid school for military signallers, and I would suggest that a class for instruction of soldiers in telegraphy be held there twice a year; men being recommended for this class by commanding officers of regiments and by the Deputy Assistant Quarter Master General for Signalling, out of the men best qualified of the army signallers. Soldiers take a great interest in Heliograph work, thinking that it is the first step towards their being recommended for employment in the Telegraph Department. Good men then would seek to become army signallers in the hope of being recommended to go through the Roorkee class of telegraphy, and eventually either to obtain temporary or permanent employment in the Telegraph Department.*

At present there is no regular system for training men as military signallers. I believe I am correct in saying that telegraph masters are allowed to train soldiers (recommended by their commanding officers), but they only do it as extra work and receive extra pay for it. At Roorkee a soldier might be thoroughly well instructed in the theory and practice of telegraphy, and provided he pass through the arm satisfactorily, a certificate would be given. Before being actually employed in the Telegraph Department he would, of course, be called upon to pass an examination before an officer of that Department.

* The Telegraph Company ought to be connected with the state Telegraph Department as the British Field Telegraph Troop is with the Post Office Telegraph Department.

4½" HELIOGRAPH, ROORKEE PATTERN.

SCALE FULL SIZE.

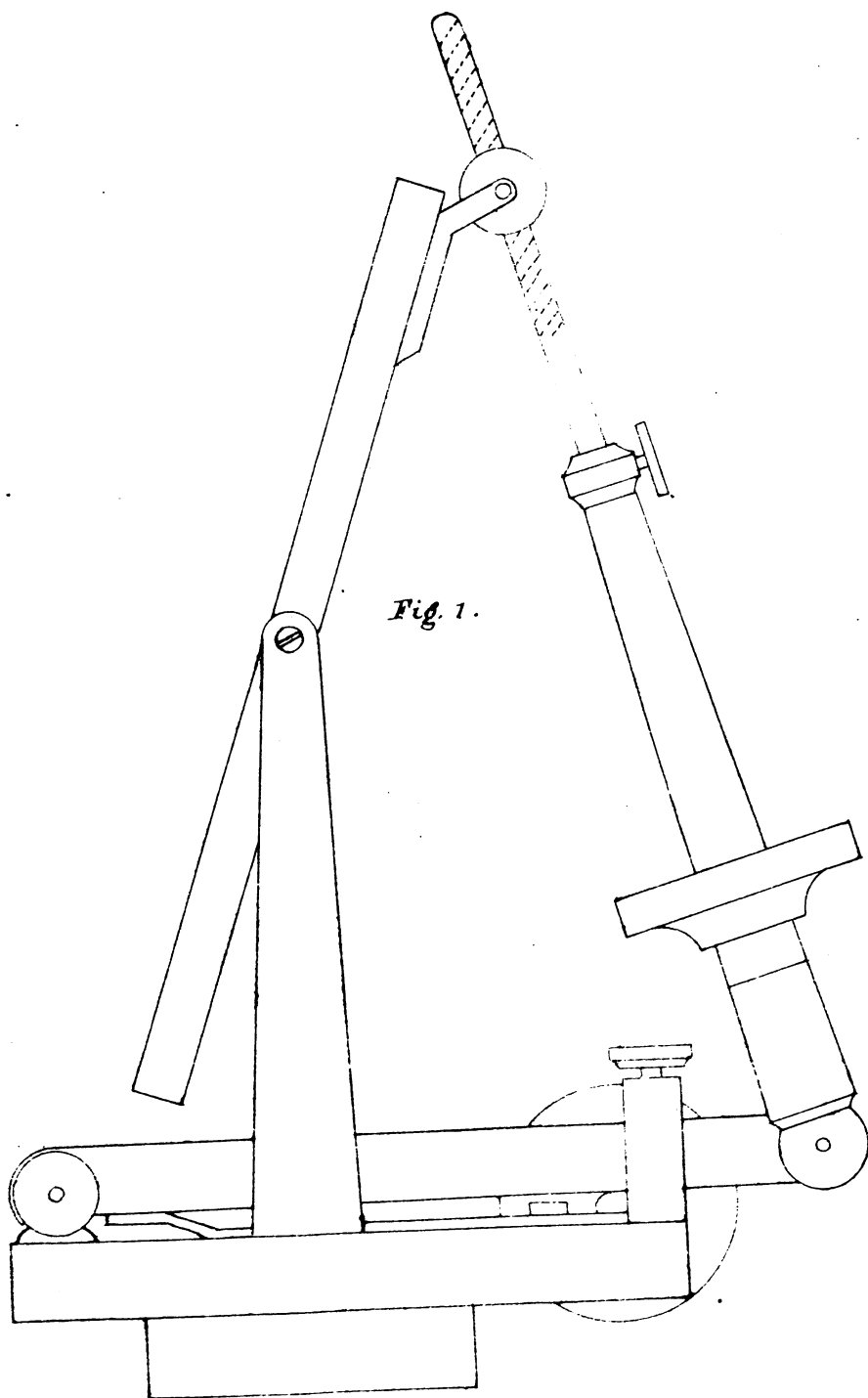


Fig. 1.

*Stand, single wooden tripod. Sighting vane and arm same as 5" Pl. 4.
Reflector same as Brown's Pl. 7.*

3" SADDLE HELIOGRAPH, ROORKEE PATTERN

SCALE FULL SIZE.

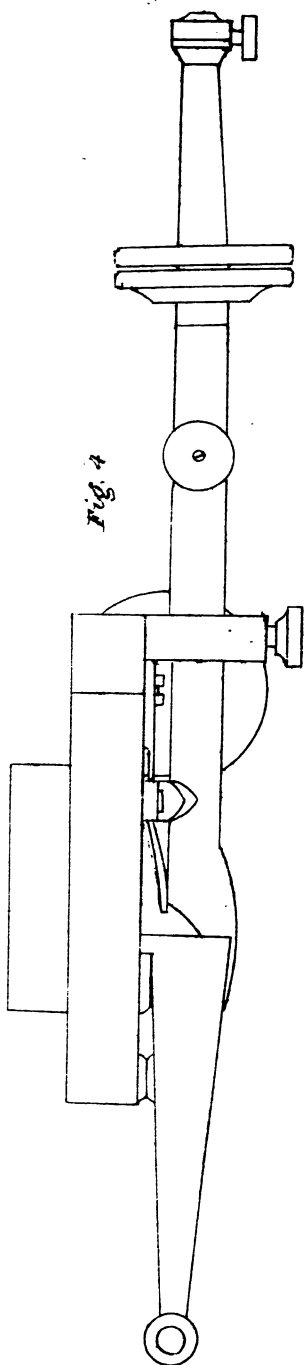


Fig. 4

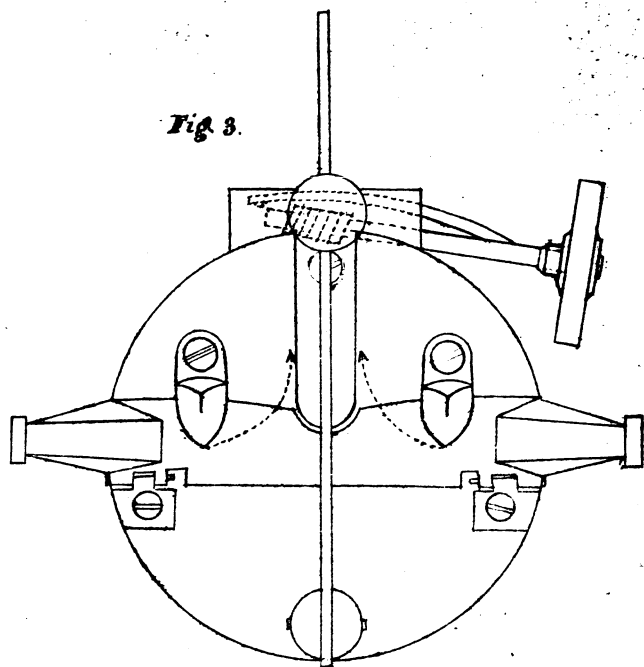


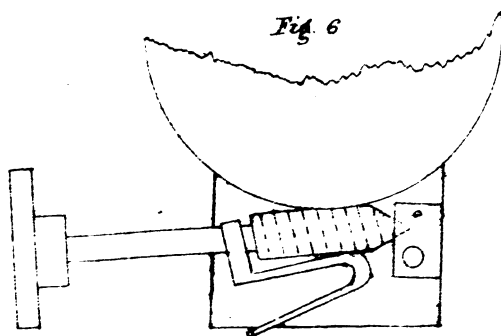
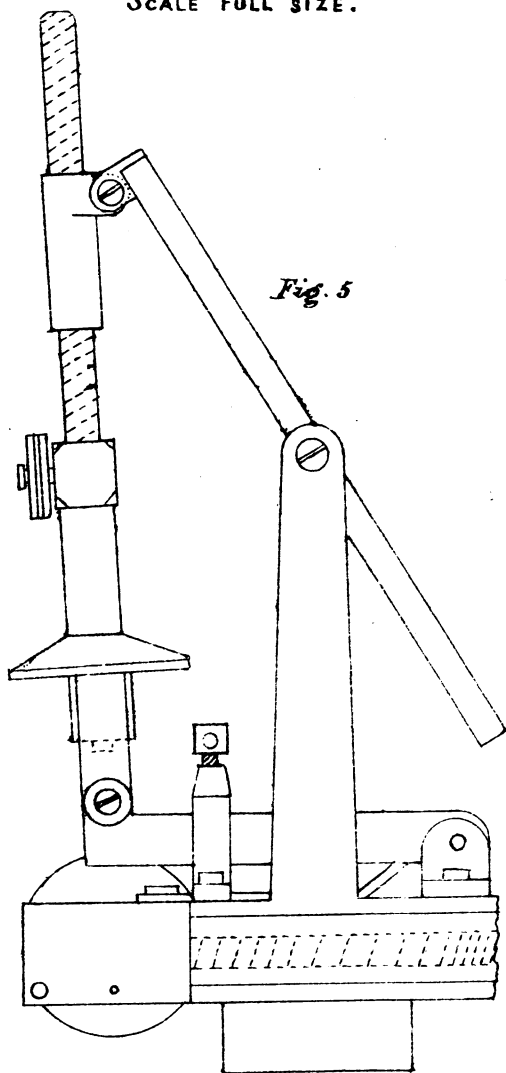
Fig. 3.

Stand, single telescopic tripod.

MANCE'S 3" HELIOGRAPH.

Patent N^o 195

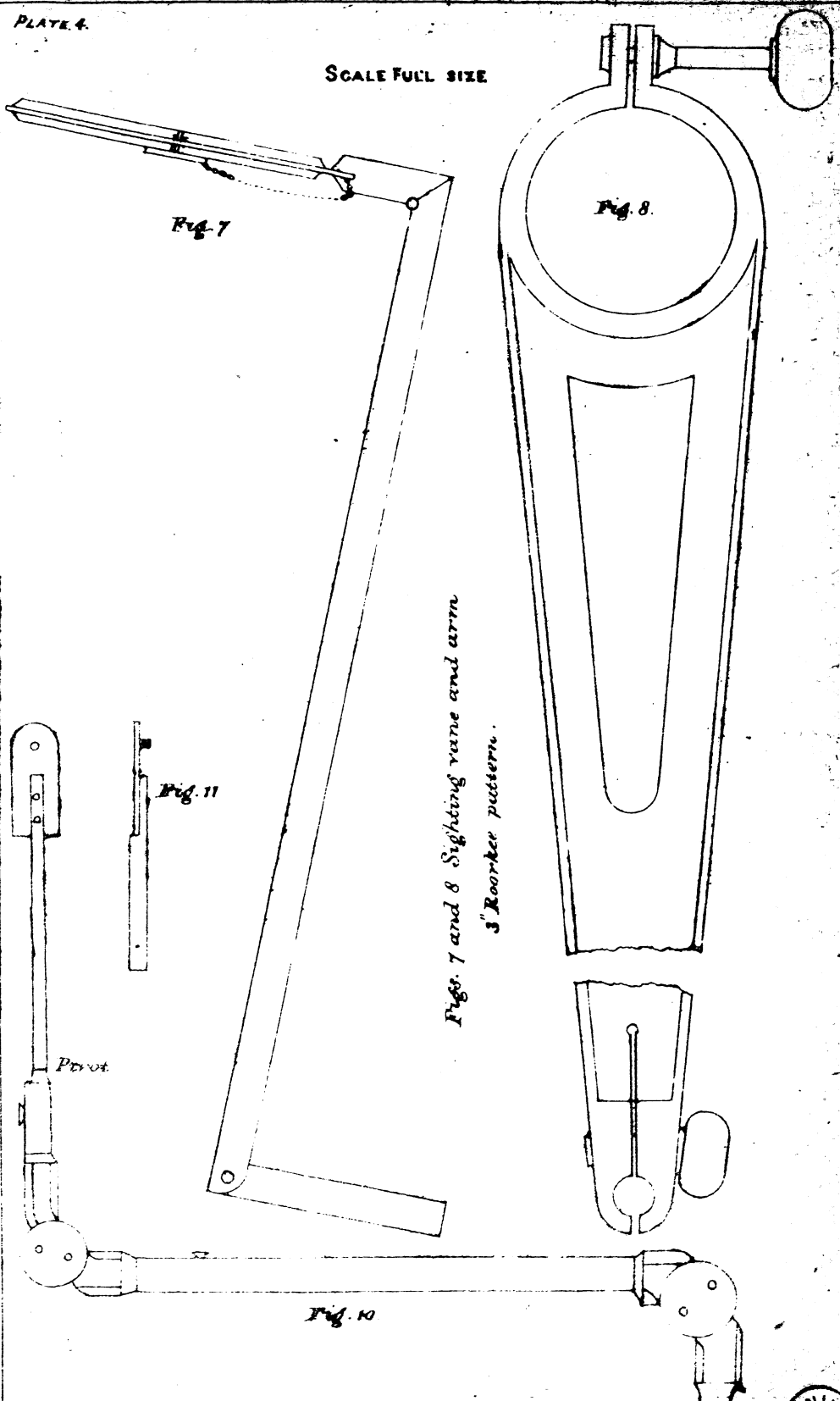
SCALE FULL SIZE.



Stand double tripod Pl. 5.



SCALE FULL SIZE



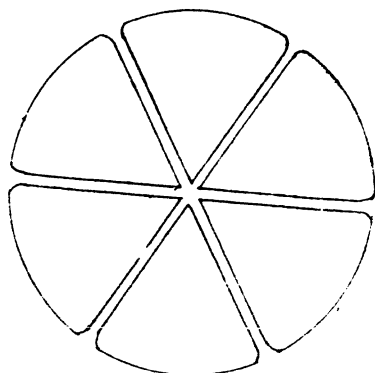
Figs. 10; 11 Mance's Sighting vane



STAND OF MANCE'S 3" HELIOGRAPH.

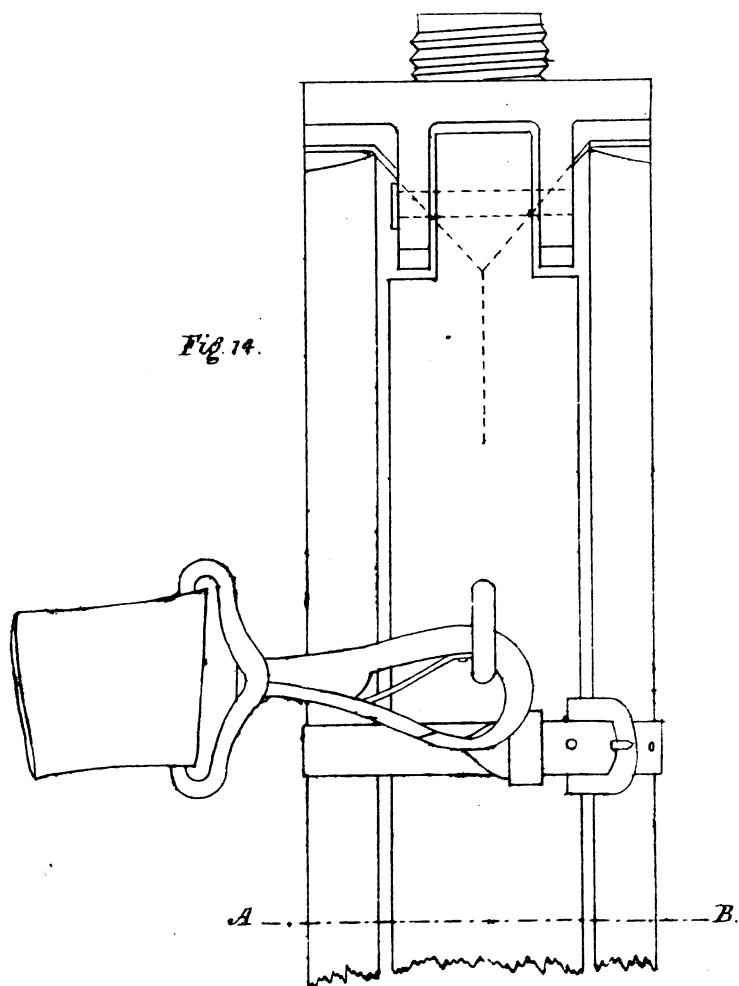
SCALE FULL SIZE.

Fig. 13



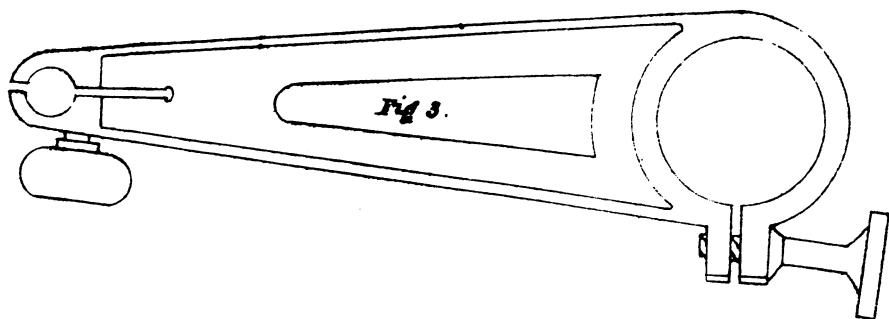
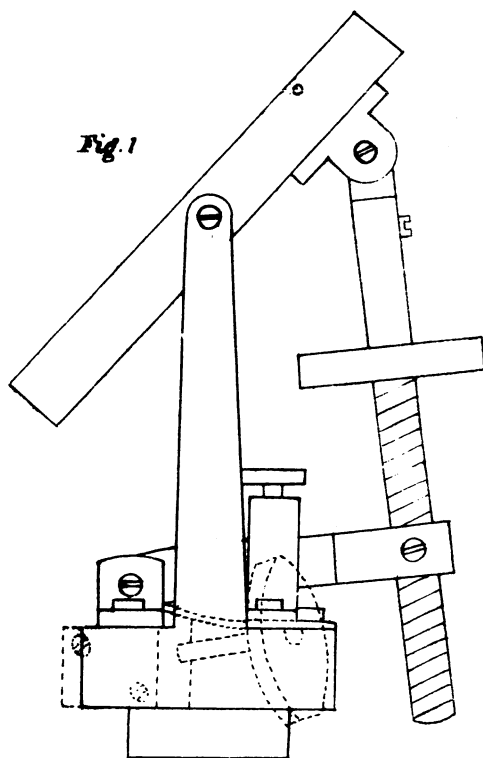
Section on A.B.

Fig. 14.



CAPT BROWN'S HELIOGRAPH, 2 $\frac{1}{2}$ "

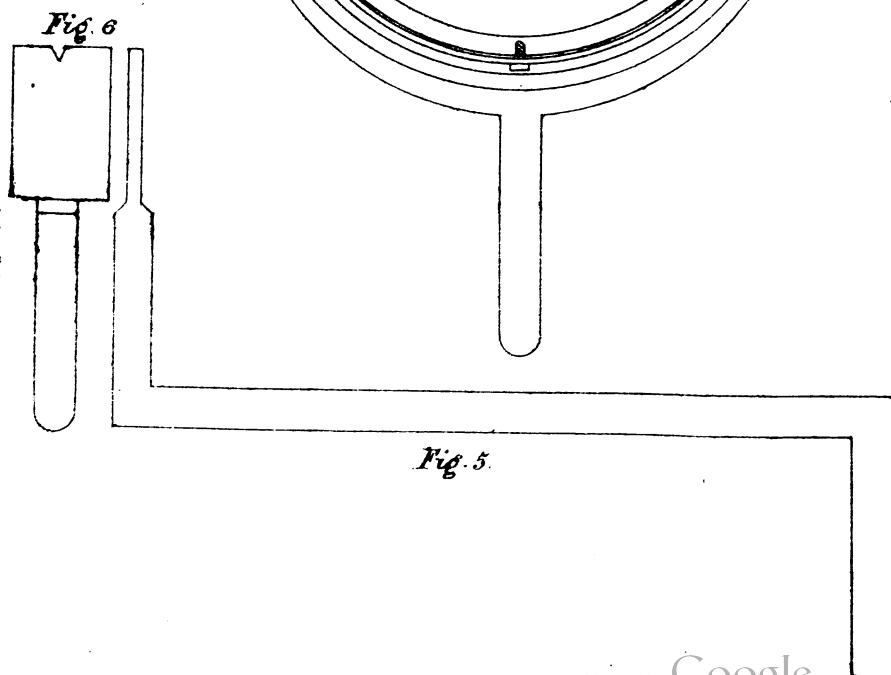
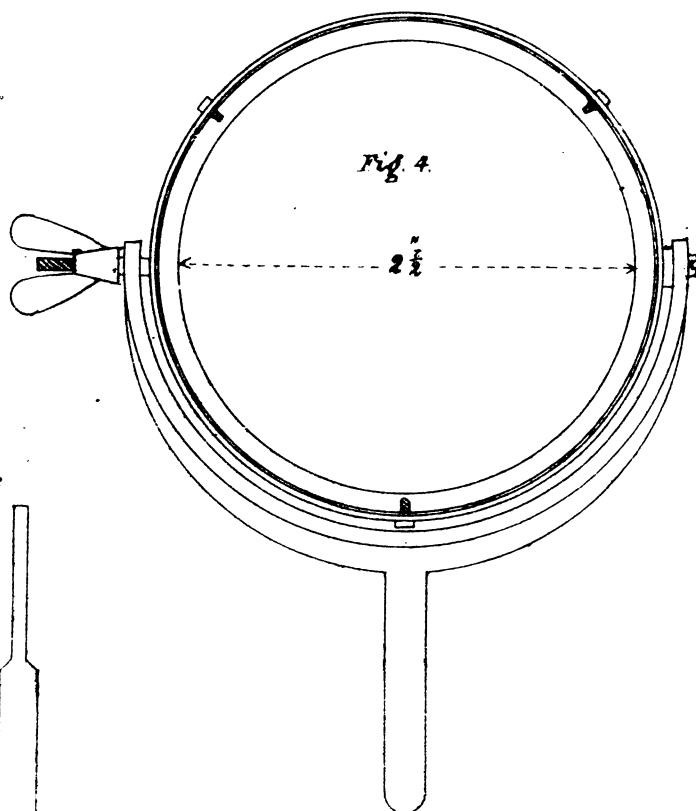
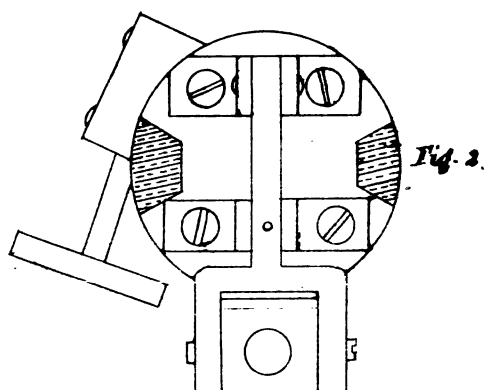
SCALE FULL SIZE.

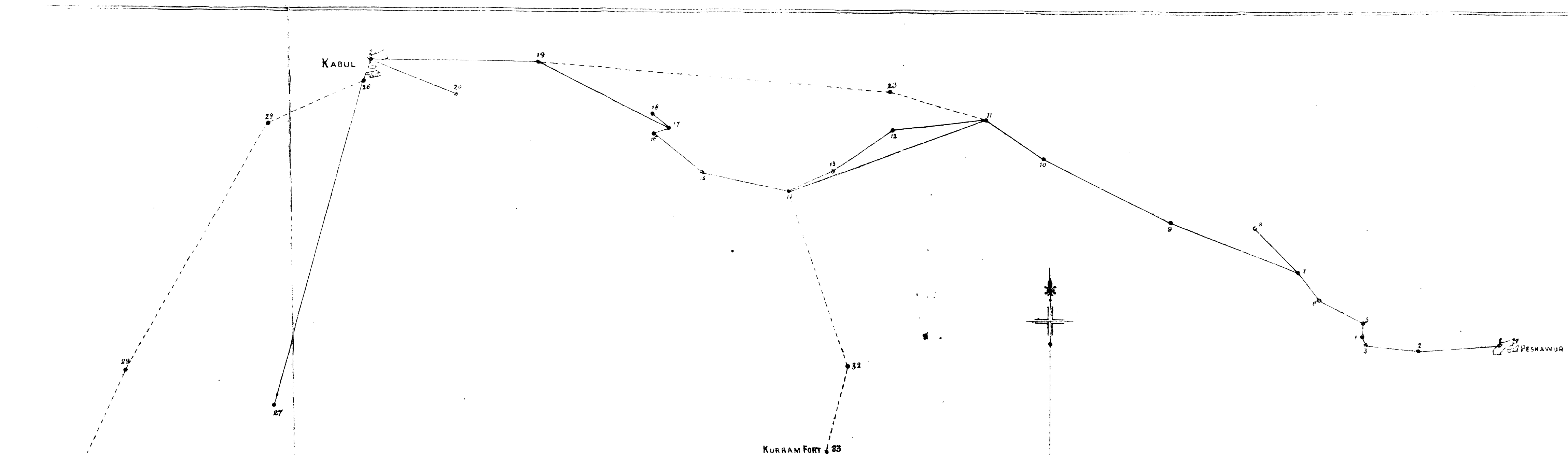


Stand, single wooden tripod.

CAPT BROWN'S 2½" HELIOGRAPH.

SCALE FULL SIZE.





- PERMANENT STATIONS.**
- | | |
|---|---|
| N ^o 1 Peshawur Church | N ^o 13 Fort Battye |
| " 2 Jamrud Fort | " 14 Safed Sang Camp |
| " 3 Fort Maude. (top of Mackeson's Incline) | " 15 Pezwan |
| " 4 Ali Masjid Fort | " 16 Jugdulluk Kotul |
| " 5 Kata Kushka | " 17 " " (Point on Shah Kik) |
| " 6 Lunda Kotul | " 18 " Fort |
| " 7 Pasgah Hill | " 19 Summad Hill. (above Lalaland camp) |
| " 8 Nakka Fort | " 20 Butkak |
| " 9 Basawal | " 21 Sherpur |
| " 10 Ali Bogar | " 22 The Darwaza |
| " 11 Jelalabad - Fort sole. | " 23 Hisarak Camp of 3 rd Division |
| " 12 Rozabad | |

- N^o 23 Darunta, connecting Jelalabad with Kabul via Summad Hill (19) - dotted line
- | | |
|------------------|--|
| " 28 Karogh | Stations for signalling between Kabul and Ghazni - dotted line |
| " 29 Saidad | |
| " 30 Sher Dahan | To show stations connecting Kurram and Khyber Lines in Mar-79. |
| " 31 Ghazni | |
| " 32 Agam Pass | |
| " 33 Kurram Fort | |

MAP
SHOWING PRINCIPAL SIGNALLING STATIONS
BETWEEN
PESHAWUR AND KABUL.

VI. DISAPPEARING TARGETS.

BY

CAPTAIN C. FULTON,
1st Battalion, Durham Light Infantry.

The recent events in the Transvaal, and the constant discussion on our present system of Rifle training, has turned General description. the attention of many to the great importance of training our soldiers to firing at moving objects at unknown distances instead of at fixed marks; this has been part of the musketry training of all continental armies for some years, and I cannot but think that some such permanent system as I have endeavoured to portray in the annexed plan (a model of which can be seen at the Institute), might be tried at some of our large stations in India, with advantage to the troops.

Mr. Mullens has invented a method which has been tried at Wimbledon this year, and, I believe, with some success; but, from the scanty information I have been able to gain regarding it, it would appear that no attempt has been made, such as my model carries out, at the appearance and disappearance of figures at different points, which can be controlled at will from the markers' butt, a most important fact in these days, when shooting at an enemy is mere snipe shooting; the arrangements I have adopted provide dummies, representing the head and shoulders of a man appearing and disappearing at uncertain places, as well as a full figure moving horizontally to right or left.

To hit these dummies men must acquire the habit of taking aim and firing rapidly.

The figures are under the entire control of the men in the markers' butt, and can be made to remain in view, for as long or as short a time as may be required; this is done by a most simple arrangement of cords and pulleys.

The advantage of having figures to appear and disappear at uncertain places, over Mr. Mullen's plan of only a horizontal movement, is obvious, and cannot but facilitate the acquirement of rapid accurate firing.

In place of the deep galleries employed by Mr. Mullens, the plan I have adopted is a small parapet, three feet in height, (above which the dummies appear) the earth for which is taken from a small ditch in front; this parapet has the natural slope of the earth, and is supplied in the interior with small buttresses, revetted with brick, on which are fixed the arrangements for the rising and falling of the dummies: these consist of a strong framework of wood, inside of which the figures slide up and down.

The horizontal movement is carried out by a small truck, on which is fixed the whole length figure of a man; this truck runs on iron rails, behind the parapet, and is worked by ropes, through pulleys, on to a windlass just in front and under cover of the markers' butt.

The figures consist of the outline of a man, made of strong iron wire covered with canvas; this renders them not only light (thus facilitating their easy manipulation), but also almost indestructible by bullets.

Holes in the canvas, caused by hits, could be at once repaired by patches of paper pasted on, as already done in the ordinary Wimbledon targets, and in the event of such a contingency as the wire being damaged to any great extent, spare figures could be provided to at once replace them, from the markers' butt; figures thus damaged could easily be repaired and used again. I consider from their construction this would seldom or ever occur.

The signalling apparatus which I have adopted, is on the semaphore principle, and consists of two arms worked by a cord; an arm on the right or left raised, signifying a hit to that side; both arms raised, signifying danger. These I consider would be all the signals required and the arrangement has the advantage of being very simple and occupying no extra space in the markers' butt.

For raising the figures, and also moving the truck, I have found that ordinary well stretched cotton rope best answers the propose; the number of men required in the markers' butt would be three, two for working the figures and windlass, one for scoring.

I have had a careful estimate made of the expense, and find that in erecting the whole, as the front of an earthwork such as I have described, would cost about Rs. 600.

The model represents the arrangement carried out in a bricked trench, for the purpose of more clearly showing the working of the entire system of pulleys, &c.; this plan, however, I would not recommend on account of the expense, and the difficulty of draining such trenches on the maidans, where the rifle ranges are usually found in this country. The parapet system, as shown in my plans, is easy of construction, cheaper, and answers the purpose quite as well: the passage leading to the markers' butt, must be revetted on both sides; either of these plans could be carried out on most of the rifle ranges in India without interfering with the present arrangements.

This has a command of 3 feet above the ground level, and thickness of 2 feet; both exterior and interior slopes are $\frac{1}{1}$; the earth is obtained from a small ditch in front, its length depends on the number of dummies required, which should be arranged symmetrically on each side of the markers' butt; the number of dummies I have represented are four, two on either side; the first 10 feet, the second 25 feet distant from the passage leading to the markers' butt; this, however, can vary according to circumstances.

Detail description--Parapet.

These are necessary to fix the frames in which the dummies work ; they are made of brick, of the dimensions shown

Buttresses.

on Plan (1) Fig. (1) ; they are sloped off sideways to revet the parapet and prevent earth falling over the rails behind, or impeding the action of the ropes which work the dummies.

The breadth of this should not be less than 6 feet and the sides of the parapet must be revetted.

Passage to Markers' butt.

Frames.

The frames which contain the dummies consist of a strong frame-work of wood having two slots at equal distances from the centre, and are fixed sufficiently far from the buttresses, by means of distance pieces, to allow for the even and free working of the dummies ; three inches from the top of the frame, and at the centre, is a pulley working on an iron pivot, (this in the model is made of brass, but wooden pullies would work sufficiently well) ; the rope for raising the dummy passes over this pulley, thence round another fixed to the frame, and is carried away into the markers' butt.

The dummies are frames of strong wire, in shape of the head and shoulders of a man ; the ends of these wires are fixed into a wooden base (weighted if necessary), on which are two pins which slide up and down in the slots before mentioned ; the rope for raising is attached to the centre of the base, and the dummy falls by its own weight.

These dummies are 2 feet 6 inches in height covered with canvas and represent soldiers.

Truck.

The truck is of simple construction, such as shown in plan (2), and runs on rails laid in rear of the parapet.

On the top of the truck is a vertical iron bar, on which is fixed the figure ; in front of this iron bar is a small block of wood, behind which the dummy rests, and is thus prevented from swinging round.

The truck is worked by a continuous rope, which starting from the two ends of the truck passes round two pullies fixed to small brick holdfasts at the extremities of the parapet, and thence passing round two more pullies, it is carried under the lines to a windlass under cover of the markers' butt.

The man turning the windlass thus works the truck backwards and forwards at his pleasure.

The Running Major is similar in construction to the other dummies,

Running Major.

except that it is the full figure, 5 feet 4 inches in height, (*vide plan*) it is fixed on the iron upright in the truck by two wire eyes, one near the centre the other at the foot of the figure.

Markers' butt.

The markers' butt is the one ordinarily in use.

In the rear some strong wooden boarding is fixed to which are fitted the pullies by which the ropes working the dummies are carried into the markers' butt.

In the sketch and model, the markers' butt has been placed close up in order to save room, but the distance can vary to suit circumstances.

The signalling apparatus is fixed to the top of the markers' butt, and is worked from below by two cords; the arms are made of wood painted white.

Signal apparatus.

I have not entered much into the dimensions of the several parts as most of them may vary according to circumstances, but what I should propose are those

Dimensions.

shown in the plans.

Plans.

The plans are—1st, ground plan and section, 2nd, detail drawings and elevation, 3rd, view in perspective.

Though my plan may meet with many objections and fall far short of being perfect, yet, if it stimulates others to bring forward a more complete arrangement for the practical training of our soldiers, I shall feel that the interest I have taken in carrying out my own ideas has not been in vain.

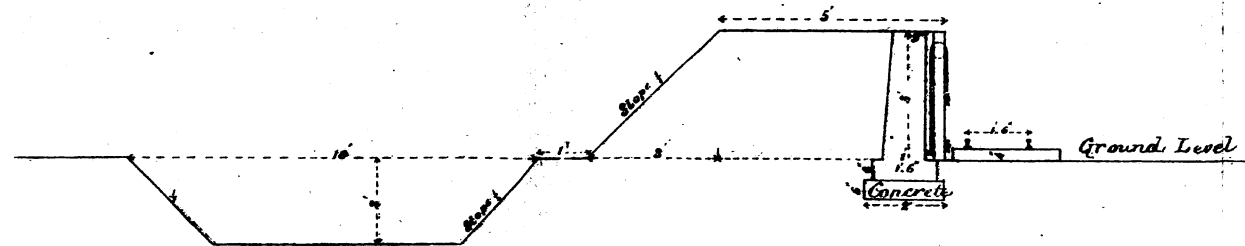
MEERUT, }
25th August 1881. }

PLAN I.

SHEET 1

FIG. 2

Section on A. B.

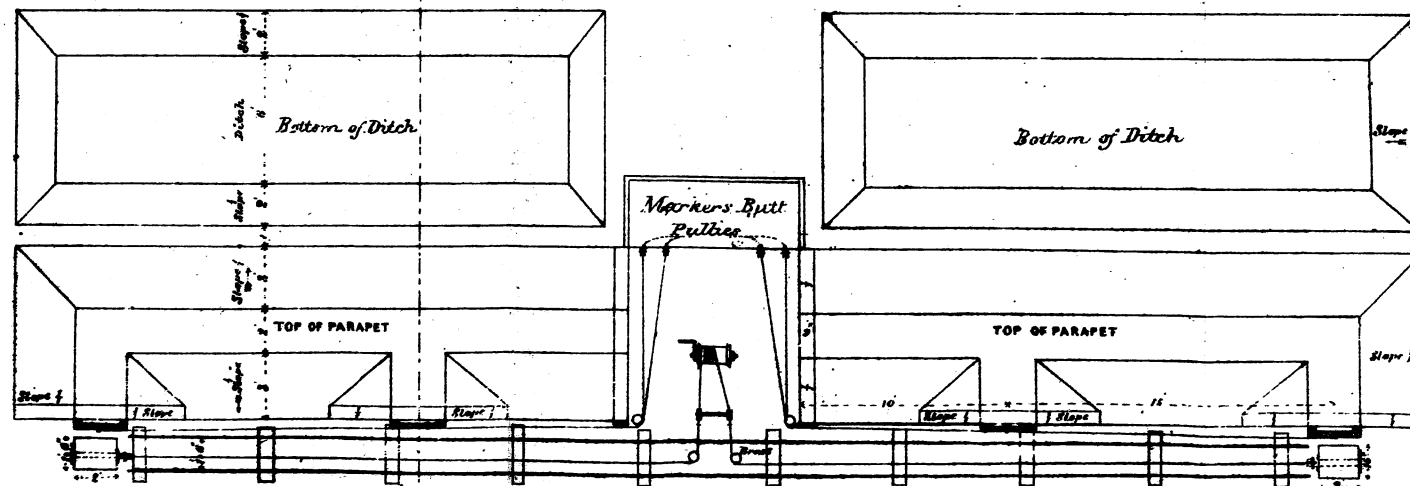


SCALE FOR FIG. 2



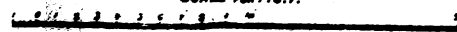
FIG. 1

Ground Level



Old railway irons or light narrow gauge rails which ever is cheapest.

SCALE FOR FIG. 1.



PLAN II.

FIG. 1.
DETAIL DRAWINGS
OF TRUCK.

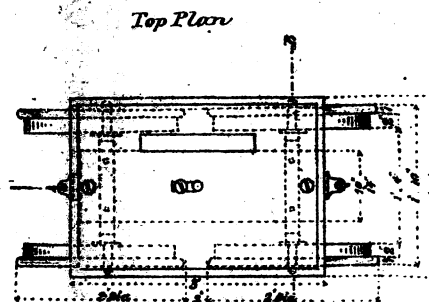
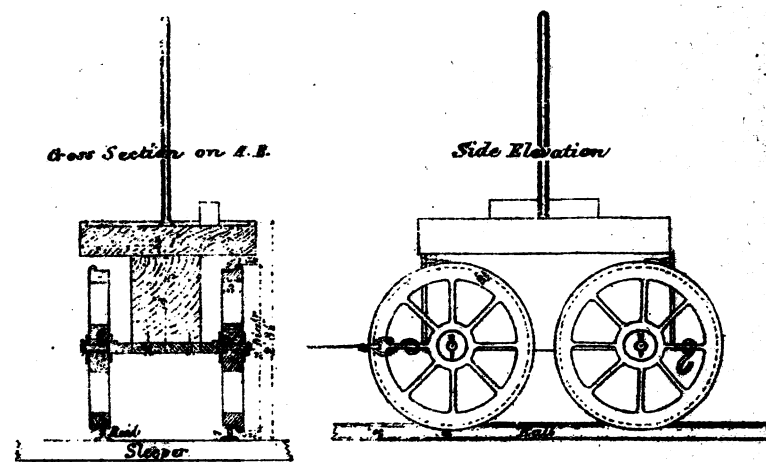


FIG. 2
DETAIL DRAWINGS
OF ARRANGEMENT AT F

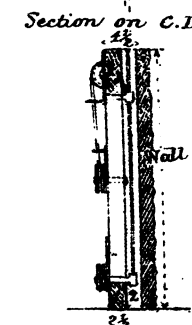
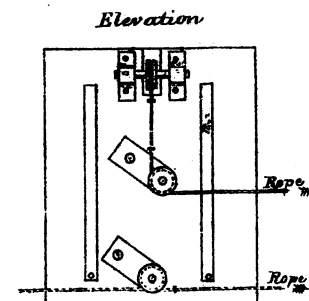
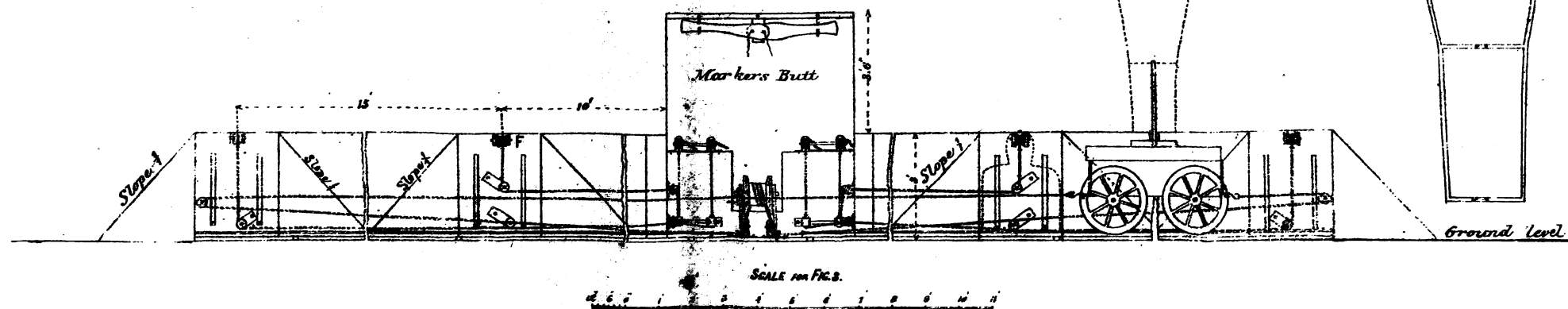
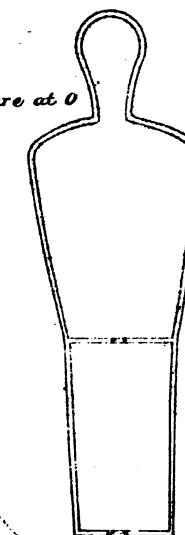


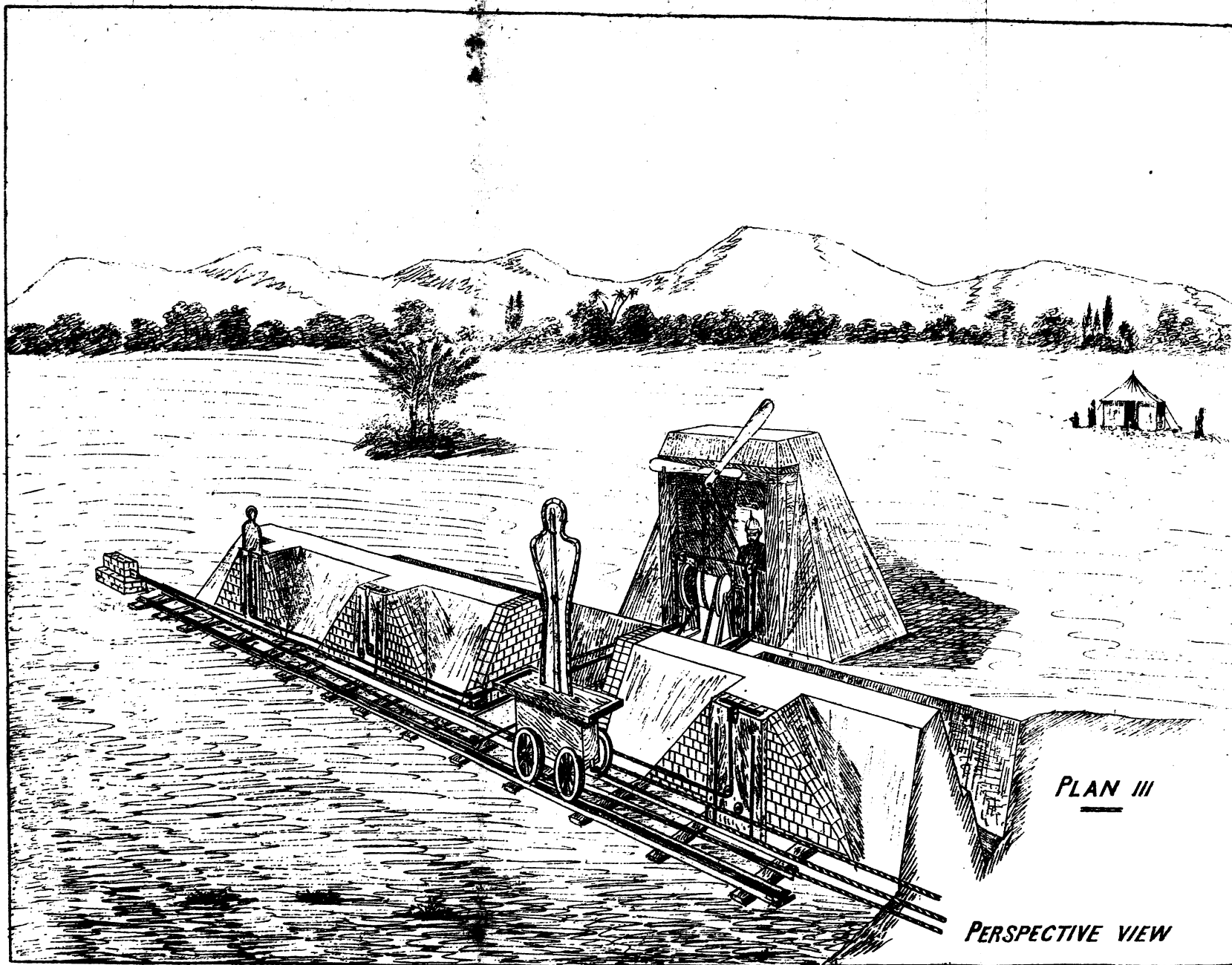
FIG. 3.

Elevation



Elevation of figure at O





The Author of Paper on "Range Finders and Long Range Rifle Sights," having mislaid, or lost, some of his notes, regrets he is unable to send for publication Appendices IV and V alluded to in footnote page 64 of Journal No. 50.

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By order of the Council,

A. D. ANDERSON, MAJOR, R.A.,

Honorary Secretary.

SIMLA, }
July 1882. }

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When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

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The Secretary will be happy to send an index to Volumes I, II, III, IV, V, VI, VII, VIII, IX and X, to any member wishing for the same.

A. D. ANDERSON, MAJOR, R.A.,
Honorary Secretary.

ORIGINAL PAPERS.

I.

NOTES ON FIELD FIRING

EXECUTED BY THE

15TH HUSSARS IN SOUTH AFRICA,

During the months of April and May, 1881.

BY

LIEUTENANT SEWELL, 15th Hussars.

Opportunity was taken, during the above months, of the natural advantages of the open and hilly nature of the country in the vicinity of the camps of the force stationed near Newcastle, to put the troops through a course of Field Firing sanctioned.

The orders on the subject were, that the troops were to be exercised under their troop officers, and according to arrangements to be made at the discretion of commanding officers; and for this purpose an expenditure of ammunition up to 60 rounds a man, calculated on the full strength of regiments and battalions, was sanctioned.

The following extracts from the Field Firing, shew the results obtained by one troop, and also, on two occasions, by the regiment, the latter practices taking place as the concluding phase of a regimental Field day.

(1). In the case of the troop practice, the accompanying rough contoured sketch (A) and sections I and II will shew the nature of the ground fired over and the distances fired from, and the following summary gives the details of the firing and the results obtained.

SUMMARY OF FIRING OF ONE TROOP.—5th May, 1881.

Troop section.	Number of men.	Number of objects.	Rounds fired.	Number of hits.	Percentage of hits to rounds.	Distances fired from.	REMARKS.	Wind.
1	11	11 helmets ... Represented in Sketch A by "lower" row of ***	110	7	6.36	250 to 310 yards.	Hits round the objects within A lateral radius of 5 feet ... } 18 And a vertical radius of 1 foot ... }	
2	12	12 helmets ... Represented in Sketch A by "middle" row of ***	120	0	0.00	320 to 360 yards.	A lateral radius of 5 feet ... } 19 And a vertical radius of 1 foot ... }	
3	16	16 helmets ... Represented in Sketch A by "upper" row of ***	160	2	1.25	390 to 480 yards.	A lateral radius of 5 feet ... } 10 And a vertical radius of 1 foot ... }	
Total.....	39	.....	390	9	2.30			

Slight, from the right front.

(2) and (3). The results of the regimental practices are shewn similarly in sketches A and B and sections III, IV and V, and summaries marked II and III.

It may be noted that in section III the ratio of the heights to distances has been left at the natural amount, in order to shew the actual angle of elevation at which the men fired.

In practice (1) the men paraded dismounted, and fired by sections, each section having its own set of objects; in Mode of conducting the practices. this case the objects were a white helmet (laid on the ground or placed on the top of a rock, as if a man were firing from behind it), for each man, who fired all his rounds at this one object only.

The firing took place in two stages, the point of firing in the first stage being for each section on a rough alignment with the point marked (A) in sketch (A); and the lines of the objects and the general alignment of the men through the latter taking advantage of all available cover, being irregular, ensured that the distance from each man to his own particular target was in no two cases exactly the same, so that the judging of his distance and correcting of it after each shot depended entirely on the individual aided by his troop officers.

In practice (2) the regiment of 4 squadrons was formed in line under cover, Nos. 1, 2 and 4 of each fours dismounted, Nos. 3 remaining mounted, holding the horses. These Nos. 3 had previously been picked out as being the *worst* shots. The dismounted men then advanced on the average 50 yards for the first attack, and subsequently another 100 yards or so, for the second; the left squadron taking ground to the left, and bringing up its left shoulders to make a flank attack on a supposed outlying picket, posted in a "laager."

In practice (3) a similar mode of attack was used, the only difference being that the men re-mounted after the first phase of the attack, and galloped forward to the second position by squadrons, the first squadron dismounting and firing, during, and to cover, the advance of the remainder.

In comparing the objects used as targets in the Field Firing in these instances, and those used in similar cases in South Africa and India, the following points may be noted.

1. The objects used in India were,
 - (a). "Ghurrahs" painted white.
 - (b). Lines of "Kanauts" 2' 6" high.
 - (c). Dummies representing guns and gunners.
2. Those used in South Africa were:—
 - (a). Helmets, white.
 - (b). Sacks used as in 1. b.
 - (c). Dummies as in 1. c.

Taking these objects all round, those used in the latter case were smaller and presented a much less evident mark than those used in the former.

The actual size of the object which was used most numerous in each case, viz: "Helmet" and "Ghurrah" being strongly in favour of the latter; the dummies too used in South Africa were smaller than those used in India. The ground too being mostly covered with long grass, against a bare plain as in India, coupled with the varying light, placed the firer at a much greater disadvantage in one case than in the other. It must, however, be borne in mind that the climate of South Africa was at the time almost perfect, and far more exhilarating than that of India even in the cold weather.

There is also one more point which rendered the Field Firing in South Africa more difficult than in India, viz: that the distances in the latter case were laid down.

1st. Stage fired from 600 to 400 yards.

2nd. " " " 400 to 200 "

While in the practice now referred to, the distances were totally unknown before the commencement of the practice and had to be judged by the men themselves aided by their officers.

The following comparison between the results obtained in Field Firing and dismounted practice in India, and in the Field Firing in South Africa, will shew the superiority of the latter over the former.

Comparison between results obtained in Field Firing in India and South Africa.

		RANGES.	
Percentage of hits to rounds fired, obtained by the regiment in Field Firing in India in 1877.		2.30	600 to 200 yards.
Ditto	do. 1879.	5.70	do. do.
Ditto	do. South Africa, practice (2).	5.49	500 to 175 yards.
Ditto	do. do. practice (3).	7.80	750 to 300 yards.
Ditto	do. dismounted practice, India 1879.	4.16	400 to 200 yards.
Ditto	do. do. 1880.	4.83	" " " "

Causes of improvement in practice.

The following would seem to be the reasons for the recent improvement in Field Firing.

1st.—A better climate, and consequent improvement in the condition of the men.

2nd.—(And least important), that each troop had been independently exercised at short ranges 100 to 300 yards, at small 18" square targets.

3rd.—That the interest taken in practice of this kind is more than it is when the ground and distances are known, and when it forms a regular part of a musketry course. The ground fired over in this case

being more interesting than that the men had been accustomed to, as affording better cover and being otherwise more varied.

4th.—That the distance was first determined by picked shots.

5th.—That Volleys were used, the executive word “fire” being in each case given. These Volleys were very effective.

But against these advantages the following disadvantages appear.

1st.—That the ground worked over was undulating, verging to the precipitous, and judging distance consequently difficult.

2nd.—That the ranges were unknown, and longer than those previously fired from in Field Firing.

Conclusions to be deduced. From the result of this Field Firing the following conclusions are deducible.

(1). As to the weapon at present in use.

(a). That a fixed backsight for distances up to 300 yards should be adopted.

(b). That a finer foresight should be substituted for the present one. The present foresight guards being abolished, as more deceptive than useful; a man when taking a rapid sight is very liable to mistake one or other of the guards for the real sight.

A fine foresight is essential, to enable a man to correct a slight mistake in aim, when continuously firing at one object with the view of ultimately hitting it.

(2). As regards the present method of instruction in shooting.

(a). After the soldier has been once thoroughly taught how to use his carbine and (above all things) how to aim, *i. e.*, when shown to use the different kinds of sight, the greater part of his annual practice should consist of Field firing, only sufficient time being spent annually at the target to ensure his keeping up the knowledge imparted to him as a recruit.

(b). The actual target practice should not be the same for all men, those who are good shots being excused the greater part.

(c). In place of the “dismounted practice with horses,” as at present carried out, and in which the men take very little interest, troops should be practised by sections on the system adopted at Wimbledon for the “Cambridge Challenge Army” and “Lloyd-Lindsay Yeomanry” prizes.

(d). In Field firing, volleys by small bodies should be frequently used.

(e). In Field firing unknown distances should always at first be determined by picked shots.

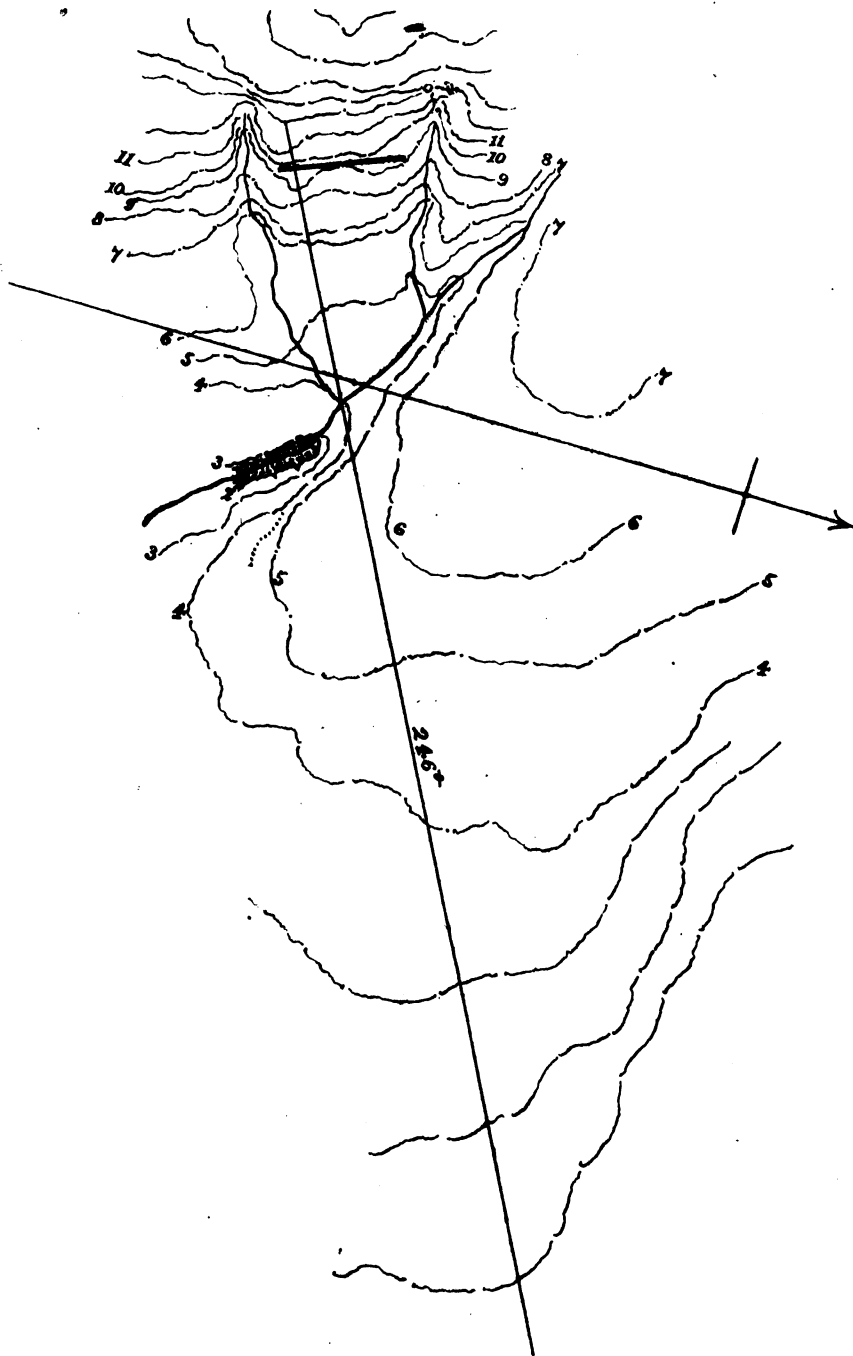
SUMMARY II. — 6th May 1881.

	Distance.	Number of men	Number of rounds.	Number of hits.	Percentage	Objects.	REMARKS.
Front attack on Line (C)	1st Stage	450 to 500 yards.	128	1224	4.33	1 Dummy figure $4' \times 2'$ and 84 helmets placed on the ground 1 yard apart.	<i>Results.</i> 25 hits on 21 helmets, and 28 hits on dummy. There were 81 hits on the rock $8' \times 8'$ on which the dummy was placed and 80 hits on other rocks within 2 feet of the helmets placed on them.
	2nd "	250 to 300 yards.					
Flank attack on Lager (B)	1st Stage	250 yards.	42	396	9.09	18 Sheets of tin $15''$ square placed round the wall of a store lager.	The hits on the lager wall were very numerous. The 10 rounds per man were fired 3 rounds independent } at each 2 " volleys } stage.
	2nd Stage	175 yards.					

SUMMARY III—6th May, 1881.

Extent of front position attacked—110 yards.	Number of men.	Number of Rounds.	Distance.	Objects fired at.	Hits at 750 yards.	Hits at 300 yards.	Total.	Percentage.	REMARKS.	
152	1,470	750 yards	5 Dummies representing a gun and 4 gunners ...	2	34	36	7.80	At each range 10 rounds were fired thus.		
	3 Screens 9' x 2'6" ...	4	56	60						
	4 dummy figures ...	3	55	58						
	2 " " wood ...	4	26	30						
	1 horse " ...	2	24	26						
			76 white helmets ...	9	9	18		5 rounds independent. 3 " Squadron Volleys. 2 " Regimental.		
								24	204	228
2,923										

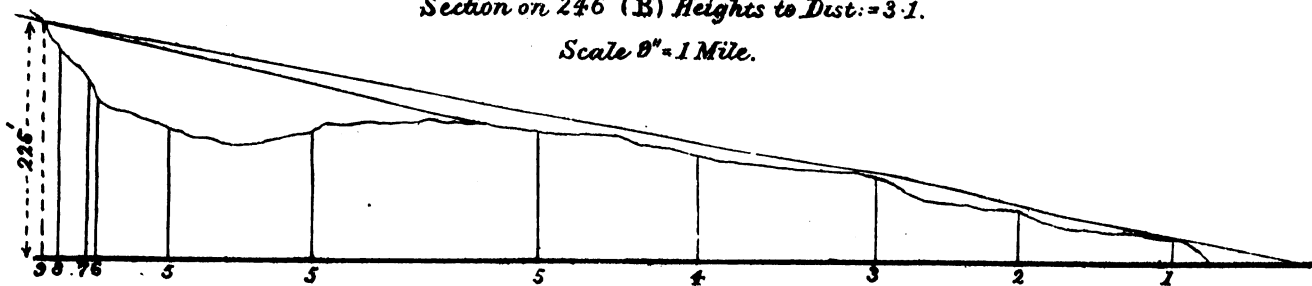
B.



IV.

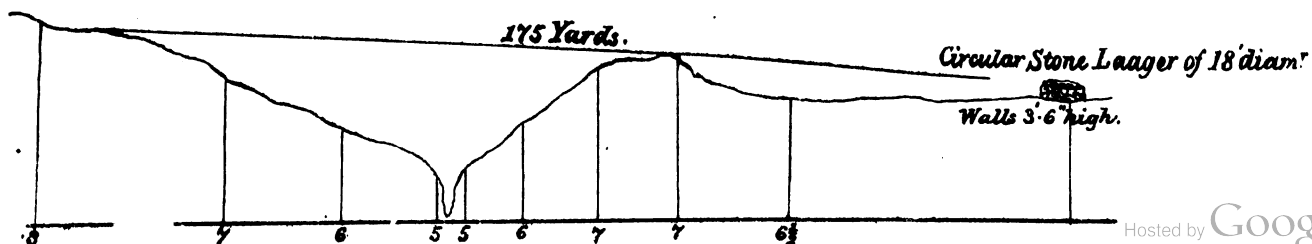
Section on 246* (B) Heights to Dist. = 3.1.

Scale 8" = 1 Mile.

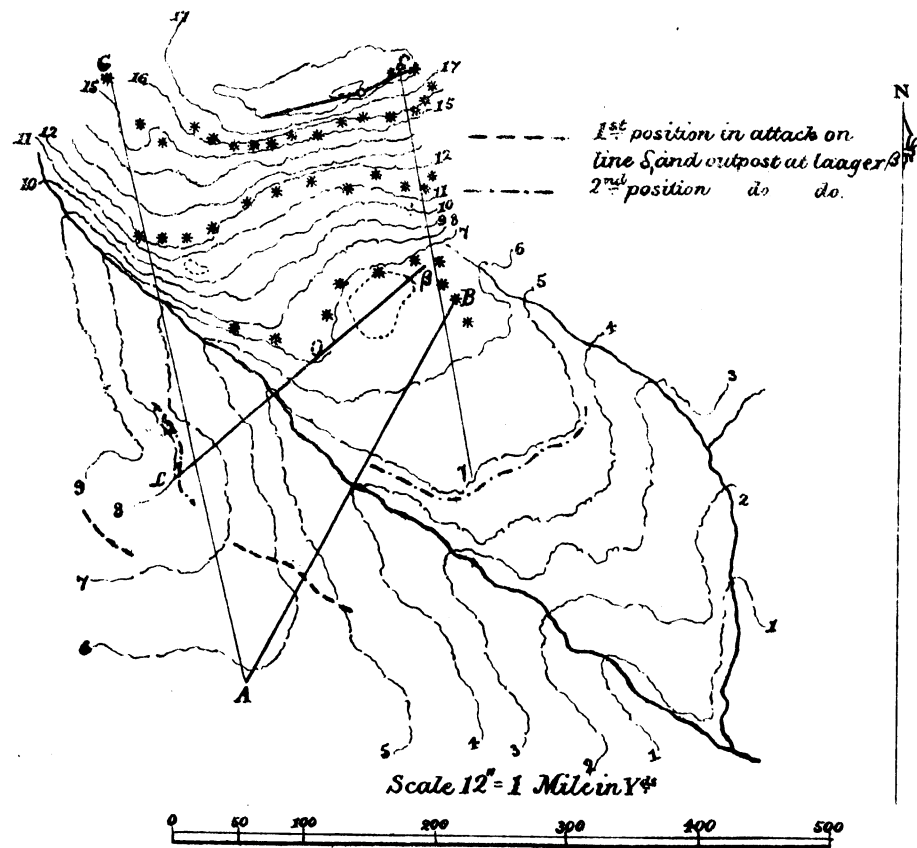


V.

Section on L B (A) contours 124'.

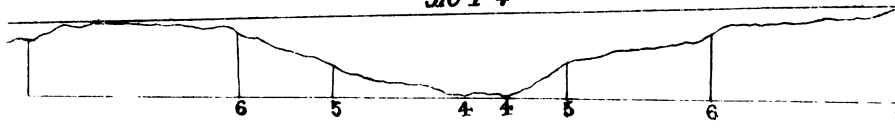


A.



I.

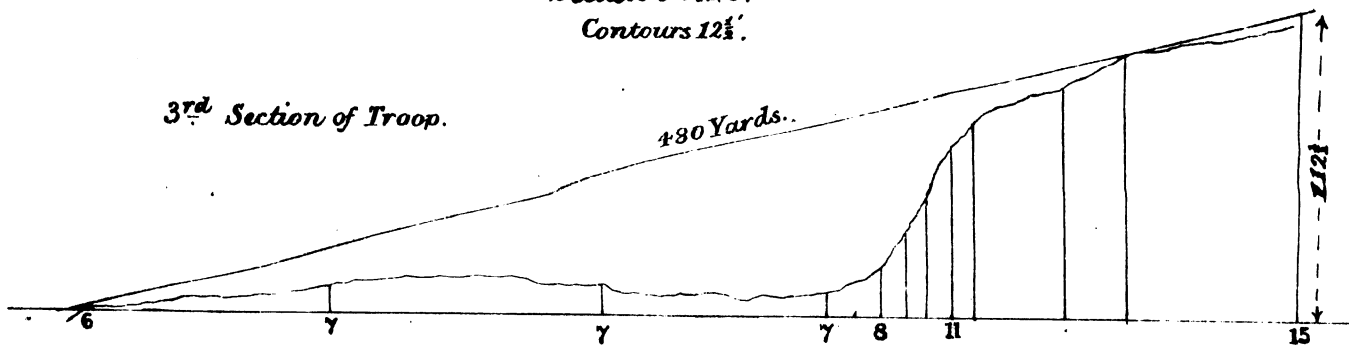
Section on A B.
Contours 12½'
Scale 24" = 1 Mile.
Heights to distances = 3:1
310 Y^{ds}.



II.

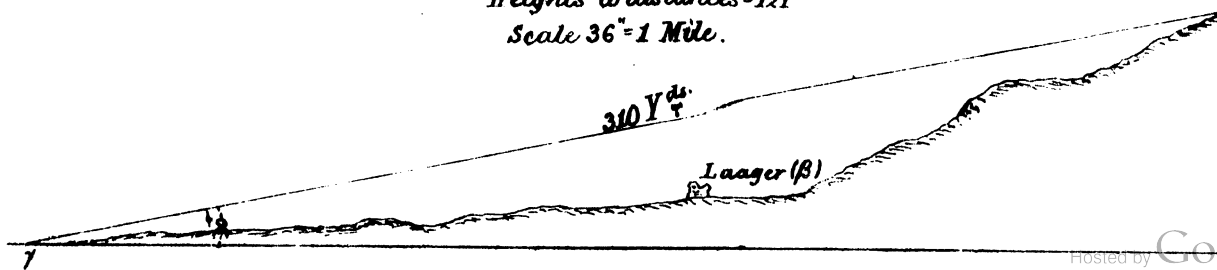
Section on A C.
Contours 12½'.

3rd Section of Troop.



III.

Section on 7 S (A)
Heights to distances = 121
Scale 36" = 1 Mile.



II.

THE COSSACKS.

BY

CAPTAIN, M. S. BELL, V. C.

*Deputy Assistant Quarter Master General,
Intelligence Branch.*

"It is said that Sir Garnet Wolseley asserted the other day that, in his opinion, the Native Indian Cavalry are infinitely superior in every way to the Russian Cossack regiments. He believes that they are more intelligent, are better armed in every way, better men, and mounted on much better horses, and that, should England ever be engaged in a great European War, she could easily spare 10,000 of them from her Indian Army. That the number of Native Infantry that could be drawn from India in such a crisis is practically unlimited. He considers that they have as good fighting qualities as European soldiers and are better marchers."—July 1881.

With reference to the above newspaper cutting, it may be as well that the Indian Cavalry officer should be acquainted with the nature of the Russian Cossack, his organization, numbers, equipment, courage, &c. &c.; in fewer words, his military value, in order that he may be in a position to calculate his chance of meeting to advantage, in the field of Europe or of Asia, a cavalry force daily augmenting in numbers, daily improving in organization and equipment, and forming, as it were, over against his very doors, preparing to carry out the now forward rôle of a cavalry corps, a rôle watched with the utmost interest by the military men of Europe during the last autumn manoeuvres both in Germany and Austria, and ably advocated by the author of the following notes, himself a Cossack. "*Fas est ab hoste docere*," yet better far is it to learn of a friend, and this is my excuse for bringing to notice a description of the Cossack force as given by one of themselves.

The notes appended, on the strength of the Cossack force, should be received as being within, rather than without, the estimate, for fresh organizations and re-organizations are in progress.

N.B.—A new Vöisko, that of "Kars," has just been created.

NOTES BY A COSSACK.

Under this title, Lieut-General Ivan Andrianow has published, in the "*Voienniji-Sbornik*," an interesting article, from the French translation of which (*Révue Militaire de l'Etranger*), the following extracts are given :—

(N.B.—Want of time to review the translation will, I trust, be held to be a sufficient excuse in all instances where the construction of the sentence follows too closely the idiom of the foreign tongue.)

General Ivan Andrianow, during the Russo-Turkish war, commanded, in the first instance, a brigade, and afterwards a division of Cossacks of the Don. He enjoyed many opportunities of studying closely these interesting troops, troops peculiar to the Russian Army and forming in it an element of strength worthy of study.

The last campaign clearly shewed their worth and, since its termination, the attention of Russia has been directed to her Cossack troops, and every endeavour is being made to perfect their organization so as to gain the greatest advantage from this, as yet, undeveloped force. The opinions, therefore, of such an authority are of much worth.

The somewhat, perhaps, too minute details, the many anecdotes aptly interspersed with the narrative, give to this article the stamp of truth which both fascinates the reader and marks it as the work of one who has both *seen* and *lived*, *what* he narrates.

EXTRACTS.

COSSACKS OF THE DON.

After a careful study of the importance of each of the factors which, in future wars, may influence the operations of infantry, and especially the rapidity with which temporary earth shelter can be thrown up, the long range and rapid fire of breech-loading rifles, the extent, the power and the precision of artillery fire, we may be involuntarily led to conclude that they give to the *Defence* a decided superiority over the *Attack*. Everything leads to the supposition that military operations in the future will consist of a series of sieges, having, as objectives, positions well entrenched and chosen with the object of there giving battle, *i. e.* their chief characteristic will be "*duration*" both as to "*Time*" and "*Resistance*." Accepting these hypotheses, it is clear that to develop the "*offensive*" element of an army, becomes of the utmost importance, and that, to this end, numerous masses of light cavalry directed against the flanks and rear of the enemy and capable of isolating such positions will render an incontestable service.

This action of cavalry against the rear of an enemy will make itself the more sensibly felt when we consider that, in the present day, an army depends in a great measure for its supplies and munitions of war upon railways. Masses of cavalry boldly raiding into the heart of the enemy's country to destroy their lines of rails will cause damage of such a nature as to place him in a precarious position. They can blow up the bridges with dynamite, break and carry off the rails, cut off water supply, disorganize the centres of mobilization, destroy magazines and depôts of provisions, seize treasure chests, raise money requisitions from towns; in a word, they can act as in a conquered country and so disorganise the territory thus invaded as to cause at least a part of the enemy's army to fall back in retreat.

It is thus that, during the last American civil war, the Southern forces acted, sending strong cavalry detachments, amounting at times to 10,000 horse, against the rear of the Northern army. Despite the

scant population of the districts so invaded, the results obtained, fully equalled the boldness of the enterprise, since the Northern force was compelled to abandon the neighbourhood of Richmond, and, notwithstanding its great numerical superiority, only when it had organised a cavalry as numerous as that of the Confederates, did it achieve a decided success.

Our country (Russia) in this respect enjoys exceptional capabilities, for it possesses, in the centre of its European territory and towards its frontiers, an innumerable cavalry, *i. e.* the Cossacks, the mountaineers of the Caucasus, Asiatic nomads, capable of being recruited at little or no cost to the State. These troops possess an organization altogether special and, of all the European powers, to be found in Russia alone.

From this arises the circumstance that our cavalry is to us a Power, and a safe auxiliary arm, eminently calculated to second the Infantry and to lighten its task, *i. e.* the slow and obstinate siege of an entrenched position; by means of masses of cavalry the firmness of the infantry will be shaken, the duration of the war will be abridged, and the number of its victims reduced.

Admitting the possibility of so conducting operations, attention is at once riveted upon the Cossacks of the Don, they being the first to hand, and capable of furnishing large numbers of cavalry. Indeed, on mobilization, the Cossacks of the Don furnish, in the first instance, 5 independent cavalry divisions, each composed of 4 regiments of the 2nd class, and shortly afterwards, 5 other divisions, made up each of the same number of regiments of the 3rd class.

The "active class" is composed of those actually serving and of those awaiting service, and is made up of three tours of service, each of 4 years. In time of peace, the Cossacks undergoing the first tour compose the active troops; those of the second tour comprise those obliged to keep up a saddle horse; those of the 3rd tour, whilst not compelled to keep up a saddle horse, must yet possess their arms and equipment complete and in good order. The two last denominations join the colours only in case of war. (For fuller details, see *Révue Militaire de l'Etranger* No 311 page 85 and note from the *Deutsche Heeres Zeitung* given at the end of this article).

The situation of the territory of the Don, in close proximity to the frontiers of the European States, and the rapidity with which it can furnish large numbers of troops, render it desirable to know the degree of preparation for war of these regiments, in order to judge exactly of their capabilities to fulfil the important mission which in future wars will be confided to them.

During the last Turkish campaign, having commanded a brigade of Cossack regiments of the 1st tour, and eventually succeeded to the command of a division composed of regiments of the 2nd tour, in all for a period of 4 months, from the conclusion of the armistice to the day of de-mobilization, I have been able practically to study, in all its

NOTE.—Cossacks of the Don are liable to military service between the age of 18 and 38 years. From the age of 18 to 21 years, they serve in the "preparatory class," from 22 to 33 in the "active" class, and from 34 to 38 years in the "reserve."

details, the military life of Cossack regiments of the two first tours, a fact that emboldens me to make known my own opinions concerning both the bad and the good sides of their organization and service.

A consideration of the foregoing remarks will suffice to convince the reader that these notes, far from having for object to criticize the Cossacks of the Don, have for sole aim to produce a wide discussion, which, by shewing the Cossack in his true light, may produce a double result :—it may destroy ill-founded opinions which I and other military men share, or at least may show the weak points of the Cossack organization, by pointing out the measures best calculated to eradicate them.

I lay stress especially on the moral character of the Cossack which is one of the chief elements of success in adventurous cavalry enterprises.

DRESS OF COSSACKS.

Head dress. In form the Cossack head-dress has preserved neither its national shape nor the advantages which arise from it. The Shako owes its origin to the soft bonnet of lamb's skin worn in Southern Russia which more or less covered the head according to the temperature, and which was well suited for the bivouac. To make it sit more firmly on the head it was made narrower above than below. It was so shaped under the reign of Catherine II ; in time the top was widened and lined internally with sheep's leather to preserve the form ; eventually it was so narrowed below to incline it over the ear that it lost altogether its good qualities and became transformed into a head-dress, of graceful form no doubt, but with the gracefulness gained at the expense of its usefulness on service, for the following reasons :—

1. It is with difficulty kept upon the head by means of a light chin strap and is easily knocked off by the sling of the rifles when slung across the shoulder.

2. It has no peak to protect the face and eyes from the glare of the sun.

3. It is useless as a nightcap.

4. It cannot be covered by the "bachlik" (hood) in bad weather.

Considering that on service Cossacks are employed on outpost duty or on the battle field, employment requiring that the eyes shall be protected, it seems to me preferable that they should wear a head-dress with a peak, the upper part narrowed so as to be more completely covered by a hood of a scarlet or azure blue color, the favorite Cossack colors. Such a head dress (bonnet) offers great advantages on service, and costs less than the one actually worn. In any case, caps of lamb's skin, narrowed at the top and of which the centre of gravity shall fall directly over the head, only should be allowed to be worn.

"*Tchekmène*."—(Tunic). The skirts of the "*tchekmène*" are so shortened that they do not cover the seat of the trousers. On service, the Cossack, generally on outpost duty, lives in the saddle, and such wear does the seat of trousers undergo that it soon has to be pieced, too often with a color little in harmony with that of the original.

Both not to shock the sight, and for the sake of warmth, the skirts of the tunic should be lengthened as originally worn.

Trousers. When the Cossacks wore jackets the body of the trousers was lengthened so as to cover the lower half of the chest; the stomach was thus covered with a belt of cloth which in a measure replaced the voluminous Turkish "Kummerbund" (sash) a hygienic dress absolutely necessary to preserve the health of the men in bivouac and on outpost duty.

Since the adoption of the "tchekmène," the private Cossack, for the sake of economy, wears trousers the body of which is made of a light cotton material, cut low. After being some time on horseback the trousers drag and the "tchekmène" rucks to such an extent as to expose considerably the abdomen to the cold. True every Cossack is provided with an under flannel belt, but this too drags with the trousers leaving the upper part of the stomach unprotected. Of late years a certain number of Cossacks, chiefly clerks, under officers and young officers, have had the bad taste so to tighten their trousers as to cause them to resemble breeches, and thus to lose the advantages of the old cut, which advantages are incontestable: besides, tight trousers soon lose shape during a campaign and cause difficulty in mounting a horse caparisoned for service, more especially so, as Cossacks ride with short stirrups.

Trousers should be made according to the old cut, be worn with braces, and should not exceed the regulation width.

Evidently, the lengthening of the trousers and of the skirts of the "tchekmène" will increase the cost of the outfit. This cost can be lessened by modifying the color of the uniform cloth, adopting, for instance, the deep green cloth of the Artillery. The high price of blue cloth is the result of the unstableness of the color: its seams turn grey with use, and violet and brown under the influence of inclement weather; deep blue cloth is dearer than deep green of the same quality.

The jacket should be replaced by the gymnastic blouse. To make up a jacket requires a skilful tailor whilst every Cossack can make up a blouse previously cut out in a tailor's shop. This dress looks well in the ranks, gives full scope to movements, and tears less easily than does the jacket.

Boots. The boots look well and are solid, but their size has little to say to that of the foot. When tight, the men wear them without socks, when loose, they wrap their feet, even in summer, in thick woollen rags. In the first case, the boot soaks in the putrid perspiration, in the second, the man's skin becomes beyond measure tender. In both cases the man's health suffers both in barracks and in the field. The evil is most evident in hot countries where it favors the propagation of typhus germs.

Besides a boot well made, the regulations must require each man to possess 3 pairs of linen and 2 pairs of woollen socks. For the sake of uniformity the length of the leg of the boot must be fixed regimentally.

Body linen. Often at inspections, Cossacks are met with having but 2 shirts and 2 pairs of short drawers. Ordinary considerations of health require that each man should possess 3 shirts and 3 pairs of drawers, which can be readily put away in the saddle bags, the pillion or the great coat case.

Lance. After the carbine, the lance is the chief arm of the Cossack, and yet it far from fulfils the requirements of an offensive arm. Generally its pole is of pine or spruce wood, a very frangible material. Thus in Dobroutscha at least one half of the lances were repaired with material that came easiest to hand on the spot. The poles of young resinous trees used for repairs broke easily, especially at the joints, because wanting in growth.

Regiments garrisoned in Poland and along the Galician frontier can readily procure beech wood. In consequence of the strength of this wood, the lance pole can be lightened by reducing its thickness.

Regiments stationed in the north can utilize, for the same ends, (*i. e.*, strength and lightness), birch plants which grow well in the dense thickets, provided always that the weight of the wood be not excessive.

The iron point of the lance is not sufficiently hard, and blunts rapidly when stuck into the ground in default of an arm rack. The point should be of steel, or at least of iron steeled. Its heel must be furnished with a boot so as to be readily pild without damage. In fixing the iron work to the pole the use of metal wire is to be avoided, and copper straps, capable of being tightened, used.

Berdan Carbine. This is the arm preferred by the Cossacks. Muzzle stoppers should not be used as they cause the interior of the barrels to rust, air currents not being able to carry off internal moisture. These carbines have a grave defect; the angle formed between the butt and the barrel is too large, a defect which causes a great recoil. The elbow formed by the butt and the barrel should be increased and its dimensions should assimilate to that of the Turkish magazine gun, which has little recoil and yet carries as well as our carbines.

Chachka. (Sword without guard). In most of these swords the blade is curved to such an extent that, at the moment of striking, the centre of gravity falls near the hilt instead of near the sharpened striking edge, thus causing the force of the blow to be considerably lessened.

This fault arises from the defective arrangement of the three chief parts of the Chachka, *i. e.* the hilt, the curved end of the blade, and its base, as well as of the relation existing between the weights of the different parts. Remembering that our horsemen deliver their blows directly, avoiding the "reaping cut," so ably practised by Orientals with their blades of Damascus steel, the centre of gravity of the sword should fall towards the point, in order to coincide with the greatest curvature of the blade, thus giving to the blow a power proportioned to the force used. The swords of the Generals of Cossack troops (with metal scabbards), are bad for two reasons; when slung they strike against the crupper, by reason of the high Cossack saddle, the part of a horse most sensible to blows, thus exciting him; in addition the metal scabbards are noisy, most fatal to surprises and unfitted for outpost duty. These swords should be replaced by Chachkas.

N.B.—By translator. A new pattern Chachka is being gradually introduced—also shoulder belt and waist belt—the former to carry the Chachka, the latter the revolver and pouches.

EQUIPMENT.

Sword belt.—Not long since the Chachka was slung from a shoulder belt. When frogs were added to the uniform of the Cossacks of the Guard, this method of carrying the Chachka became inconvenient, the straps soiled and rubbed the ornaments, and the general introduction of the sword belt was the consequence.

The chief characteristics of cavalry movements are the rapidity of its pace and the length of its reach ; thus the 1st Brigade of the 1st division of Don Cossacks, covered 115 versts (77 miles) in 24 hours, after the passage of the Danube, marching by indirect roads from Matchin to Toultscha. During forced marches, the Chachkas should be carried so as in the least to tire the horseman and to avoid wear and tear. Now, as worn, the sword slings are fixed to the waist belt by means of a weak sewing ; the prolonged effect of the weight of the Chachka causes the attachments to give, whilst at the same time the belt presses most detrimentally on the stomach. The officers' frogs are likewise too weak. The Turks and Roumanians use a belt of double the width of ours ; during the last campaign so great became the inconveniences noted above, that most of the officers converted their waist belts into shoulder belts as used in the Caucasus. The defects of waist belts are still more heightened when revolvers are attached to them, and during operations requiring breath, this equipment becomes altogether unbearable except to those who enjoy the most perfect health. The continuous rubbing of the revolvers also causes great wear and tear to the accoutrements and dress. These inconveniences, unnoticed in times of peace, become in war of great importance. I consider, therefore, that the waist belt should be replaced by the shoulder belt of the Caucasus pattern, furnished with the metal carbine swivels. By means of a special waist belt the revolver should be carried—in addition, on service, a leather strap should be attached to the upper part of its case which would pass over the left shoulder ; in this manner both arms will be supported by the clavicle, (collar bone), a method which, whilst adding to their stability, will prevent any compression of the digestive organs.

Cartouche case.—The shape and arrangements of these are good, but not being impregnated with tar, exposure to damp and heat causes them so to shrink that the ammunition is held in them as in a vice, and the cartridges become difficult to extract. I have seen a strong Cossack, only by use of the greatest force, able to extract a cartridge, so shrunken was the cartouche case. They should be made of Hungarian leather.

From the above remarks we conclude that the leaning of the Cossack troops towards elegance and economy have caused them to adopt a uniform, and in part an equipment, of a nature at variance with the rude necessities of service and their rôle as *Advance Guard troops, Intelligencers, and Cavalry of the Line*. To carry out such varied duties requiring them to remain in the saddle for long intervals, exposed at times to the heat of the sun, and at times to crawl and to hide in ambuscades, their uniform should be of full size and give ample

scope to all movements; in reality the Cossack has to modify it when actually on service. Thus, the 1st Division of Don Cossacks left their shakos at Braila; their "fourachkas" (caps) were provided with peaks; the officers turned their waist belts into shoulder belts; as for the trousers, they were in such a state that cloaks had to be worn for very decency's sake. A return to the old order of things is much to be desired.

Tentes-Abris.—The "Tentes-Abris" was the most humanitarian innovation of the last war; it prevented the devastation of the forests and the carrying off of stacks of straw to construct huts; it gave shelter against rain, wind, cold and sun, it was always at hand; finally, when worn in bad weather, they served to prevent the cloaks becoming saturated. To facilitate this latter use, and to enable the men to adjust them to the form, the number of button holes should be increased.

Train.—The train has been considerably lightened, and the vehicles of that of the 1st Division of Don Cossacks experienced no difficulty in following the troops, except after heavy rains or over very clayey soils steeped with it. The ambulance wagons must, of necessity, be of their present large size if to answer their requirements.

It seems to me difficult to organize a train to fulfil the conditions of mobility and size required to suit all possible theatres of war; *i. e.* those of Europe, intersected by roads, and those of Asia, void of all carriage roads. In all cases the fellys of the wheels should be wide, otherwise deep ruts are made; the carriage allotted to officers is too small, more especially as detached duty is taken by "sotnias," and but one wagon is given to one division, (2 sotnias),

Harness.—All parts of the harness were good, solid and well adjusted. If, however, time will allow before the departure of the regiments of the 2nd and 3rd tours, it would be advisable to adjust the wither bands and to examine and strengthen the various leathern straps.

Amongst accessories, attention should be turned to the picketing ropes, and in peace time this important question of equipment and of the bivouac should be settled; is it preferable to use the picketing stakes furnished to the 3rd division of the Don Cossacks or the rope picket in use in the 1st Division?

If pickets have the advantage of relieving the regimental carriage of heavy weight, *i. e.* heavy ropes, piles, &c., they still to me present grave inconveniences: if badly attached to the saddle, the iron point may wound both horse and man; moreover, the last war did not show them to be sufficient to hold the native steppe horses on all soils. In times of panic, of frequent occurrence during storms, rendering regiments liable to great losses, it is questionable whether they will hold firm.

Nagaïka. (Cossack whip). True it is that a blow of this whip wakes up the horse and increases his speed, it, however, has its bad points; unexpected blows on head and neck inspire a habitual fear in the Cossack horses not noticeable amongst regular cavalry horses; the least object passing quickly before their eyes renders them liable

to start back and disarrange the serried order of a manœuvre. Besides, when manœuvring with the lance, and the horseman requires to hasten his speed, he is deprived of all means of doing so, or even of preserving that acquired, because he has no hand at liberty for the whip. True, the Cossacks of the Caucasus also use the "nagaïka," but they, having no lances, are never so situated. The sword, by drill regulations, is only drawn during the charge and under the very eyes of the enemy.

When the horses are in good fettle and trim, the inconvenience of having no whip hand at liberty is of no moment, but on a campaign, horses wearied with excessive toil have to be dealt with. Cossacks of the Line as well as Cossacks of the Guard should wear spurs. These spurs should be without rowels so as not to inconvenience men passing through vegetation, and noiseless, so as not to interfere with the Cossack's special duty; they should resemble the spurs of the middle ages, *i. e.* being bent round and slightly pointed.

Horses. The horses of the Don Cossack territory increase in height year by year, and, naturally, the horses of the regiments participate in this advantage. Thick set horses with an ambling shuffle or slow paces are no longer met with; on the contrary the horses, whilst gaining in height, have become more active and tractable. The experiences of the late campaign have proved them to have lost none of their powers of endurance. After a march of 115 verst (77 miles) in 24 hours from Matchin to Toultscha, made by a detachment of Major General Tanow's Cossacks, a day's repose sufficed to restore the horses to their wonted vigour. The following example will give some idea of the striking vital power of the horses of the Don.

The 17th Regiment of Cossacks was told off for duty with a column of infantry; after excessive fatigue necessitated by detachment duty, convoy escorts, reconnaissances pushed to a distance, outpost duty, &c., the horses were so exhausted that it became necessary for the commandant of the 14th Corps to order the regiment a prolonged rest on arrival at its bivouac at Mahmoudakein. At a review, held 9 days after this, the regiment had quite recovered itself and its horses compared in mettle and vigour to the best of the other regiments of the division. Long experience has shown that the introduction of Persian and Arab stallions into the studs of the Don have produced excellent results. The offspring of Russian stallions, well favoured and with rounded proportions, are soft and without endurance. True these last, by the manner in which they are reared on the steppes, become more vigorous and improve when cut off from all stable cares; in years of scarcity and severe frosts none but the fittest survive and these are strong and approach to the type of the horse of the Don; it seems to me useless to introduce into troops, stallions of a type which all true horsemen wish to see disappear completely. The improvement of the horse is limited by no law; it is then very desirable that the rearing of troop horses should be encouraged, not only by the purchase of Arab and Persian stallions, but also by the introduction of the "Argamaks," stallions from Central Asia, principally those of the Tekke race which may be looked upon as the most perfect types of Cossack

horse, because of their swiftness and endurance. Those who were engaged in the Khiva campaign can affirm that none of our cavalry ever attempted to follow the enemy's horsemen mounted on their rapid "Argamaks." A limit to height should be fixed for Cossack troopers: stirrups are worn so short that, with a complete war kit, men of medium size find the greatest difficulty in mounting a horse of more than 1·5 metres, (14·3 hands); horses of greater height are also more difficult to feed.

Cossacks have little love for their horses and treat them badly. They beat them with whatever comes to hand on the head and neck, so that the horses fear their riders and tremble at the sight of them.

Such treatment produces results equally bad both in peace and war. In war they are fidgetty and ready to bolt at an unaccustomed sight; in peace it causes the brusque and ill-regulated movement of many horsemen, movements attended with disorder in the ranks.

The men of the regiments of the 2nd tour of the 3rd division of Don Cossacks, stationed in Poland, will, if possible, dispose of their horse's forage to their own advantage. In war time their conduct towards their horses changes somewhat; they then begin to see that on the strength of the muscles of their horses depends not only the good of the State but their own safety; they then do not fail to feed them well.

Cossacks can manage their horses with great address; it is not rare to see a Cossack of low stature throw by skill and keep down a strong horse.

The method of shoeing is most defective and displays a complete ignorance of the structure and growth of the hoof, as well of the importance of a rational form of shoe; the result is that, in Cossack regiments, horses with contorted hoofs and affected with inveterate quitter bone are frequent. The first defect can be corrected by remonstrances and supervision; the second by sending the farriers to centres of conscription to learn the art of shoeing and thus making known the advantages of good shoeing.

Combatants. Although the law of 1874 altered in no essentials the organization of Cossack regiments, it produced good results in that it fixed definitely the term of active service and kept only the youngest contingents serving during peace. Cossacks of the older contingents kept alive ancient traditions, some excellent, others pernicious and calculated to corrupt the coming soldier, such as the love for strong drinks, rapine and pillage. The latter vice arose less from want of moral character than from a reminiscence of old times when it was the custom to invade periodically the territories of the enemies of their religion, the success of the raid being measured by the amount of plunder carried off.

Young Cossacks, subjected during youth to the iron rule of their fathers, reared in that rusticity which characterises to this day the inhabitants of the Don territory, join their regiments ready to obey and to readily execute the orders of their superiors, *i. e.* they are thoroughly impregnated with the essential principles of military discipline. Being uncorrupted in the practical school of life, withdrawn from the influence

and example of Cossacks of the old régime, they are disposed, from their ignorance of the necessities of regimental service, to accept without reserve and with all the ardour of youth, the councils, teachings and requirements of their chiefs; in a word they resemble soft wax that may be readily moulded.

This being the case it can be understood that regiments of the 1st tour, in the hands of good chiefs, leave nothing to be desired in respect to behaviour, but that, on the other hand, they can as readily be ruined when under men unworthy of the high command and responsibility entrusted to them.

In the 1st Division of the Don Cossacks all the regimental commanders were men of honesty and sterling qualities. When the XIVth Corps had established itself along the Trajan wall, I was sent with the Cossacks of the 2nd Brigade to arrest the flight of, and to bring back to their homes, the Tartars who emigrated in mass towards the south from fear of contact with our troops. On our first meeting, a happy combination of circumstances enabled me to render them such services that they stopped their exodus. Gradually gained over by the honesty and mildness of the Cossacks, they established themselves in the villages along our advanced line and opened friendly relations, supplying our troops with forage, meat and vegetables. So great was the confidence in the Cossacks that distant Tartar villages sent their herds for protection to villages close to our position. Without exaggeration, on the fertile plains in front of the 2nd Brigade, waved luxuriant crops; here innumerable herds of cattle sought a verdant pasture, and the coffers of the Tartars were filled with clinking coin. Notwithstanding this intercourse the Cossacks of the 2nd Brigade were never, by greed of the Tartar gold, induced to break their discipline.

These good relations withdrew the fidelity of the Tartars from the Turkish Government, and, with the exception of the neighbourhood of Bazardjih, all sympathised with us. Those near to us entered into our interests, informed us of the vicinity of Bashi-Bouzuks, gave information relative to the numbers and position of the Egyptian troops, &c., &c., even aiding the 17th regiment to fight at Mamouzlami; they carried the regimental baggage and formed convoys which enabled our troops echeloned along the Trajan wall, to be provisioned during the bad weather.

Other instances are given of the results of the good understanding with the Tartars, arising from the good treatment of the Cossacks, which it is unnecessary to detail here.

These services are confirmed by the General Order of the 29th March 1878, addressed to the XIVth Corps, which points out that it was altogether due to the confidence inspired by them that a general exodus of the Tartars was stopped and the sympathy of the people of Silistria gained, a sympathy testified to by an address of thanks to the troops and the presentation of a diploma of citizenship to their chief.

When alone, the Cossack is naturally thoughtful and morose; in the midst of his comrades he is gay and full of animation: in time of leisure as well as of difficulty the bivouac resounded with songs, laughter and games.

The Don Cossacks of the 2nd tour of the 3rd Division also received satisfactory testimony to their general good discipline and morality; they are far, however, from being on a par in these respects with regiments of the 1st tour: strenuous efforts and rigorous measures were necessary to keep them on an equality with the latter.

It is not right to judge of the good behaviour of Cossack and regular regiments by the same standard, the former are frequently split up into small bodies without even "prikazuyi" or "gefeets" in command; the men of the latter are constantly under the eyes of their chiefs and can be checked in time if they show an inclination to mis-behave.

SERVICE.

On service, Cossacks are eminently distinguished for calmness and good sense, both being distinctive qualities in their character and to which they owe their aptitude as artillerists and advance post intelligencers.

The exactitude with which they acquit themselves of all duties entrusted to them is beyond praise. They do not seek to put themselves forward but never shrink from an enterprise, however dangerous, and execute it with as much zeal as intelligence. They are peculiarly apt at finding places to which directed and individuals to whom sent. They have an eye for country and a great precision in estimating distances.

Their capabilities of bearing fatigue, and their constitutional strength, are not less remarkable. For several months, especially after our check at Plevna, service was very hard. During the whole time that elapsed from the departure of the 29th Cossack regiment from the line of advanced posts to the arrival of the regular cavalry, the 4 regiments of the 1st Cossack Division were required to guard the country stretching from the Danube to the Black Sea, an extent of 60 versts (40 miles), holding the line of the Trajan wall, 12 to 17 versts (8 to 11 miles), in its front. The regiments of the 2nd Brigade were divided into 3 detachments, 4 sotnias strong, each furnishing $1\frac{1}{2}$ sotnias to the advance posts, whilst the remaining half of the 2nd sotnia held the inner line. They daily, twice or thrice, reconnoitred the neighbouring country, besides undertaking detached reconnaissances at unstated periods; in addition, daily foraging parties were required to journey at least 4 versts (3 miles). Such work was calculated to exhaust both man and beast, but such was not the case; owing to the abundance of provisions the men actually became stronger. Although the State pays to the Cossacks an indemnity for the mowing of green forage, by which they provide themselves with linen and sheep skin cloaks, yet as these latter were only made over to them in the spring, the men were obliged, during winter, to make up for themselves a somewhat light wadded cloak. To increase their misfortunes their guard cloaks were worn to threads. In this sad plight, the Cossacks, chilled by cold blasts, soaked with rain and snow, perished by cold on outpost duty or during long marches, were deserted by neither their energy nor their traditional gaiety. "Ah! my children," an officer would remark, "we are frozer, is it not so?"

"Oh no, your honour, it is well enough, although a little fresh," would always be the jovial reply. I was especially struck with their endurance during our raid on Moncabeg, on the 30th December, when our troops crossed the Balkans. The thermometer read 18° Reaumur (8·5° Fahrenheit) below zero and a snow storm shrouded the horizon; in such a cold it was necessary to march 75 versts (50 miles), and at its conclusion to detach a sotnia of the 17th regiment on outpost duty. As soon as placed, such a snow storm arose that at 11 o'clock at night it was impossible to find the pickets in order to withdraw them to the village. The next day the sotnia was found and despite this rude experience only 8 cases of freezing occurred out of an effective of 8 sotnias!

Wounded Cossacks exhibit no less firmness in their sufferings. I have never heard them groan or complain even during operations and the dressing of wounds.

When the columns advanced over wild wastes, in the presence of the enemy, the chain of patrols extended so far in advance as to be nearly lost to sight, giving one unaccustomed to the spectacle the idea that the army was without covering parties.

Never did the Cossacks, on advanced duty or on patrol during the march, give false or exaggerated information of the enemy. The reports of both officers and men were borne out by facts.

Their noble love of glory appeared in the complaints addressed to their chiefs when kept in reserve. Amongst others, I may mention that of the 1st sotnia of the 18th regiment at the affair of Ichäir-Orman when kept in 2nd line.

In the fight Cossacks show more taste for individual combat than for concerted operations in compact order directed by a will different to their own. As soon as small parties of the enemy appear, a cloud of volunteers demand permission to attack; thus, for example, at Medjidié, Tatarkein and Mangalia, individual horsemen manœuvring skilfully managed to take or to kill almost every Turkish horseman who showed himself, and amongst one of the first of these, a major. Nothing better indicates the warlike instinct of the Cossack than these single combats; with remarkable prudence they glide behind folds of the ground, they fall unawares upon the flanks and rear of the enemy, and invariably take or kill adversaries whom they may chance to meet.

In a word, the Cossacks of the 2nd Division, following in the footsteps of their fathers, were in truth, the "eyes and ears" of the army.

The "Ouriadniks" (under officers), taken from the élite of the Cossacks, are endowed in a higher degree with all their qualities. Their discretion, discernment and zeal leave nothing to be desired.

The social relations of the "Stanitsa" are preserved in the regiment, and by letter, constant communication is kept up with those absent for some time on military service; consequently in the "Stanitsas" it is at once known if any render themselves obnoxious to their regimental companions.

From this it results that the influence of the rich over the poor, which reigns in the Stanitsas continues to make itself felt on service,

and as the "Ouriadniks" are not always in possession of a competency, they find themselves socially dependent upon the "big-wigs" who, despite their riches and position, or that of their families in the country, have remained in the Cossack ranks. On this account the "Ouriadniks," in the execution of their professional duties, have to act diplomatically and in a manner that militates against the good of the service, *i. e.*, refrain from exerting their full authority for fear of being exposed to social inconveniences on return to their country.

OFFICERS.

Reared in the midst of families possessing lands of greater or less extent, the officers are, from their earliest years, familiarised with the requirements of a practical life. Aiding their relations in the cultivation of their hereditary domains, they are accustomed in the steppes to undertake distant enterprises on horseback; such a life develops their physique and accelerates the acquirement of intellectual faculties. Called to the colors, the Cossack officers give proof from the first of the qualifications necessary to form a good cavalry soldier; robust in health, well mounted, with a perfect knowledge of horses, knowing how to find their way in the open country, indefatigable, and well able to live a simple and rude life.

Cossack officers possess all these qualities in a high degree; to them must be added the "sang froid" which they possess in an equal degree to the Cossack of the ranks and the remarkable zeal which they throw into the accomplishment of duties confided to them. More than once I have been astonished at the exactness with which they have brought from a distance a detachment to a rendezvous, even at night, and when it was impossible to read maps and to discern objects.

In battle and on advance post duty, they serve with distinction and are remarkable for the morality of their conduct; the officers of the 17th regiment especially attracted by their zeal the attention of the Commandant of the Division from whom they several times received commendation.

When the officers of the old school, as regards knowledge of war and the customs of the service, are compared with those who graduate now at the schools of Youngers, it must be confessed that the palm falls to the latter. To rise to the level which they have attained, the old officers have had the experiences of long practice and war; the new, however, we instruct from the commencement of their service; "knowledge is power," and it is certain that the generality of the young officers entering the service with all the knowledge acquired at school, will equal, and even soon surpass, their older confrères who possess only the knowledge that they have been able to pick up themselves.

On the other hand, the older officers are endowed with undeniable qualities; with their extreme sternness they intermingle a softness of manner and willingness to teach their younger brothers-in-arms how to equip themselves for active service and to initiate them in its practices; they are, in a word, excellent guides and councillors; amongst them too are met excellent horsemen who do not disdain to set an example

in military exercises, such as steeple-chasing, shooting, &c. The old officers belonging to the regiments of the 2nd tour of the 3rd Division of Cossacks, from circumstances which I am unable to explain, were, both in knowledge of work and morality, much above the younger officers of the same division and distinguished generally by their solid qualities. This, I think, arises from the commanders of the regiments of the 1st tour having, under various pretexts, kept the élite of the young officers in their own corps. In all cases it may be affirmed that on mobilization the old officers constitute, amongst the Don troops, a most useful element.

Since the last wars in America and Europe, cavalry has entered upon a new phase of usefulness and has commenced to exhibit qualities wanting to the army of the old school, *i. e.*, rapidity, far reaching enterprise, boldness in operations, powers of reconnaissance; in a word, they have rejected the "heavy" traditions of the middle ages to replace them by the fiery audacity of the most renowned horsemen of Asia.

This transformation opens to the Cossacks of to-day a field of action more vast than in the past. On comparing the recruits of the Cossack regiments with those of the regular cavalry, it must be acknowledged that the Cossack has preserved, more than any other, the typical character of the true cavalier. No people of European Russia can furnish men so skilful in managing horses, so devoted to riding. Possessed of extensive domains assuring to them a means of living, they can give themselves up to the enlargement of their intelligence; they have capital wherewith to found schools. The extent of their lands allow them to increase the number of their horses and to perfect their cavalry breeds, notwithstanding that they already furnish a cavalry horse as enduring as spirited.

From these considerations, and bearing in mind that the pacification of the Caucasus has closed for ever to the Cossack his best school for war, and that time will effectually weaken the traditions which were fostered from the cradle, it will be advisable to supply artificially this want by creating in the Stanitsas schools where aspirants to the grade of "Ouriadjnik" (under-officer) may acquire the knowledge indispensable to service reconnaissances, *i. e.* the power to read maps, to draw plans, the theory of projectiles, the general knowledge of the spirit and requirements of cavalry tactics, so that, after leaving these schools, he may be able to conduct a reconnaissance, direct those of the Cossacks and aid the officers of the general staff.

In order to examine the rôle which it is desirable that the young officer of the future should play, I must enlarge the circle of my observations and dilate upon the military value of a "viosko" which depends entirely upon the most intelligent classes in its midst; consequently the influence exerted upon classes by conditions of domestic life must be considered.

NOTE.—The term "Viosko" (troop) is employed to designate Cossack territories; thus, one speaks of the "Viosko of the Don," the "Viosko of Astrakhan," as of the Government of Moscow, of Vladimir.

It is noticeable that the "Viosko" is becoming yearly more impoverished from purely physical causes, the sun is kind but the heavens are unkind, dearths last at times a decade, and, in consequence, land deteriorates so rapidly that middle aged men are struck with the ravages made since their youth.

Thus the Touzlow, which traverses the districts of Miouss, flowed 40 years ago full up to the brim, it abounded with fish; streamlets flowed through the neighbouring marshes. Now nothing is seen but its dry and stony bed; the streamlets of the region have suffered in a like measure. The produce of the ground not equalling the cost of tillage, agriculturists are ruined, compelled to seek other means of subsistence, they have *per force* re-taken to the rearing of cattle and horses, their employment at the commencement of this century.

This economic transformation has been carried out very extensively along the shores of the Don to the advantage not only of this region but to that of the whole of Russia.

Below Manitch numerous troops of excellent horses find grazing grounds; amongst them thoroughbreds are in the larger proportion. In the "yourts" (Cossack parish lands), the "stanitsas," and on private farms, horse breeding is carried on. All this was organized under the spur of dire necessity and owes less to science than to vigour.

Few of the old breeders have any experience, and what experience they have is gained at the cost of great sacrifices. It is much to be desired that in the centre of these rich runs a school should be established where the fundamental notions of phisiology, the breeding and rearing of the horse, may be acquired. Once in possession of this knowledge the proprietors of stock, &c., would soon return, with interest, into the coffers of the State, the capital expended on such an institution.

Let us now consider the military question. In making a comparison between the intellectual level of the Cossack of the ranks and that of the officer, considering the amount of developement required by each of these two elements, and their respective spheres of action, I find that the advantage lies with the former. In thus judging, I mean in no way to disparage Cossack officers, many of whom have passed through the Academies and schools of Youngers, and who, as a whole, in general knowledge, are in no way inferior to officers of the regular cavalry; I wish only to praise the rank and file. The few direct relations that discipline permits with the Cossack rank and file do not allow of their intellectual culture being readily appreciated, but when circumstances lead to a more intimate acquaintance, one is involuntarily struck with the extent of their knowledge, their judicious appreciation of men and things, and their tendency to analyse and modify their opinions. To gain the confidence of such intelligent soldiers and to submit them completely to their influence, the officers who command them must largely add to their own knowledge and perfect their own personal education.

Reflecting upon this inevitable consequence of conditions peculiar to the country, one is forced to hope to see a superior school of cavalry, if not erected in the Don Territory yet at least a 3rd class added to the

school of young men, where young men might, independent of their military studies, acquire accurate knowledge of the veterinary art and its allied sciences, whilst being given at the same time the opportunity of practically studying horse-breeding in the studs of the State, the nurseries of blood horses established on the frontiers of the territory. These branches of knowledge closely concern and are both equally useful to an educated horseman. Besides they would have a good influence on the prosperity of Russia herself, for the Don horses have acquired such a reputation that they are used for remounts in the regular cavalry. During the last war the Viosko furnished more than 40,000 horses for its own contingent. In times of peace the Cossacks of the Don amount to 25% of the effective total of regular cavalry, whilst in times of war they themselves are twice as numerous as the whole of the regular cavalry. If the reforms proposed were put into force, the Russians would possess the best regiments of guide cavalry in the world, and the Cossacks would, relatively to the regular cavalry, hold a place similar to that of the *chasseurs* to the infantry of the line. At the same time, the special services of the Cossack would dovetail in perfectly with the general exigencies of the cavalry arm as understood at the present day. In reality, whilst all designations of cavalry obey common rules in their movements and operations, yet there exists a tendency to develop in each a distinct speciality—for instance, dragoons develop the power of fighting on foot. To especially consign the service of reconnoitring to the Cossacks would in no way be in opposition to the general spirit of cavalry service, and this service so well suits the Cossack character and his natural instincts, that to realize this desideratum it is only necessary to increase and extend the knowledge of the "Ouriadniks" and of the officers.

In either case, in times of peace, the officers, after leaving the academy of Youngers, whilst serving in the regiments of the 1st tour, must be made to work seriously and to fathom the varied conditions that cavalry must nowadays fulfil, by judicious reading, and frequent practice in eye sketching, plan drawing, fortification and study of the war game.

INSTRUCTION IN TACTICS AND MANŒUVRES.

When I assumed command of the 3rd Division of the Don Cossacks it was completely organized for service as regards material; in personal instruction, the preliminary part, comprising the instruction of individual horsemen and the manœuvres of small parties in close masses, only had been practised.

The experience which had preceded this preparatory drill was apparent everywhere. In the whole Division from flank to flank the ranks were perfectly dressed, the troopers handled with ability the sword and the lance, leapt obstacles, skirmished in open ranks "à la Souvarow," and made their horses lie down. After I took command, commenced the regimental manœuvres.

The charge in close order, sharply pulled up to make the horses lie down, is an extraordinary manœuvre; a long deployed line charging

at full speed, halted of a sudden and within a short distance, the horses linked by twos were caused to lie down under the guard of 4 men per squad, whilst the remainder of the troopers advanced, formed into an infantry battalion, and fired with precision. For a double reason it appears to me desirable to retain this manœuvre. In the vicinity of many a position, such as an escarped ravine, &c., such shelter is available that horses lying down can be wholly concealed; in such a case a manœuvre of this nature renders possible a great accession of rifle fire. Again, in times of peace, the manœuvre is an excellent one to test the skill of the horseman and the aptitude of the charger for the fight.

The men seemed to me vigorous and alert. The detachments charged with the destruction of railroads and telegraphs were especially well organized and perfectly instructed. I make no mention of the regiments of the 1st Division for, if a year of war experience sufficed to transform loutish peasants into agile soldiers, how much greater must be its influence on the personnel of regiments previously well trained and drilled.

STANDARD.

It is difficult to conceive an orthodox Cossack regiment without its traditional standard. Nevertheless this emblem is a very troublesome one to care for, particularly in regiments commanded by venturesome chiefs. It may happen that during bold movements over open country, particularly in the night or foggy weather, parties of cavalry are unexpectedly surrounded by the enemy; such an instance occurred in the 2nd campaign during the 2nd reconnaissance of Bazardjik.

During long reconnaissances the security of the standard is a constant source of care to commandants of regiments, and often forces them to act with extreme caution. If to this it is added that Cossack regiments are constantly and for long periods split up into detachments, and that the protection of the standard is left to what remains of this disjointed regiment; that the power of rifle fire and the dispersed order of fighting of infantry compel cavalry to operate on lines extended to an extent to render it impossible to give it proper attention, then it will be admitted that the colours, the natural symbol of troops of position, should serve only as a rallying point in the bivouac and as the sacred emblem of country. They should be replaced in action by sotnia field colours of variegated hue similar to those of Asiatic cavalry. The commanding officer of the regiment should be provided with a special colour somewhat larger to indicate the point of general assembly.

BIVOUAC.

It seems to me that such an extension is given to the bivouac of regiments that it is difficult to defend them in case of sudden attack and to cover them by an interior chain of sentries. The tent of the Colonel should be pitched on the flank of the bivouac in the same line as that of the officers. (This tent is pitched in rear of the centre of the squadrons, behind it stand those of the regimental staff and train). The colours, the treasure and the police tents should be established

close to it. By this means the void space between the tents of the combatants and non-combatants would be diminished.

Parties of Cossacks, more or less removed from the main body of a detachment to occupy an advanced post, should be always ready to defend themselves: to effect this it is necessary to modify the place of the train and of the horses of the under staff so that the attachment ropes of the latter may be immediately behind, and at a certain interval from, the troop horses; behind them will be the tents of the non-combatants, and in rear of all, the wagons. By this disposition the rear of the bivouac, at all times most exposed in case of surprise, will be protected by the wagons which will form a sort of entrenchment. This modification in detail will make the bivouac less visible and easier to defend.

It must be received as a rule that with Cossacks, pass words in a strange tongue must not be given even if laid down in the regulations. The word "Wagenburg" for instance. During a night march I found that not one Cossack in five could remember or pronounce the word correctly.

ORDER OF MARCH.

During the many expeditions made across the undulating steppes of the Dobroutcha whose frequent folds were very fitted to conceal enterprising Tcherkesses, the regiments of the 2nd Brigade (of the 3rd division of Don Cossacks) adopted the following dispositions as a means of security against surprise. (These measures were also rendered necessary by the irregular trace of the roads, formed of a succession of zigzags which made it most difficult to direct the chain of patrols during the march, especially when the latter stretched to a distance from the column). On all four sides patrols were thrown out, each composed of 2 men, furnished, one half by the advanced guard, one half by the rear guard, and forming a sort of outer mobile framework. The links at the angles were accompanied by an "Ouriadnik." From the head and the tail of each fraction belonging to the head detachment, from the advance guard of the main body, and from the rear guard in addition, towards the direction of the external patrols, isolated horsemen were thrown out, who formed a second inner framework, with the object of transmitting orders to the outer chain during the march. The detachment was thus enclosed within 2 chains, the outer composed of links of 2 horsemen, the inner of links of single horsemen.

Also, with the object of hastening the transmission of orders, links of 2 Cossacks marched between the different fractions of the column.

This disposition gave great security, and the outer chain of horsemen, seeing themselves connected with the inner chain of patrols, reconnoitred boldly to the flanks and with great coolness estimated the enemy's strength and dispositions, giving also to the detachment ample time to assume fighting order.

LAVA.

(A peculiar method of attack in vogue amongst Cossacks.)

This formation, altogether special to Cossacks, presents the following inconveniences.

1. Loss of time necessitated by the preliminary despatch of Ouriadniks on the wings of the Lava to indicate its extreme limits.

2. Disposed for the charge in a single line and at wide intervals, the front is exceedingly weak and can be readily broken by an enemy charging in compact order and in ranks.

The upholders of the Lava formation maintain that the weakness of the line is apparent only, and that once launched to charge a serried mass, each horseman traverses the radius of a circle gradually nearing the centre and forming, at the instant of collision, a mass of sufficient density. This idea would be admirable did the enemy await the charge at the halt, but as he advances himself with impetuosity, he will meet the lava before it has become serried. This formation can be usefully employed during pursuits or to envelope the front of an enemy whose wings rest on bodies of troops in compact order of line of battle.

When, however, I consider the qualities of Cossacks in deployed order, the cohesion and regularity of pace to which they have attained, the impetuosity of their horses, their momentum, capable of breaking the ranks of an enemy, and the length of their lances, enabling them to outreach their opponents, it seems to me that a Cossack charge in serried order would be irresistible and in all cases preferable to the shock produced by the lava. Unfortunately the armament of the Cossack does not fully answer the requirements of serried tactics, for the following reasons.

1stly. If the enemy has awaited the shock and a hand to hand conflict results, want of space prevents the Cossack handling his long lance to advantage in the *mêlée*. *2ndly.* If the Cossack in the front rank succeeds in spearing his adversary or misses his mark, he, in either case, is not only deprived of his only mode of defence but cannot trust to be protected by his rear rank man who will be in a still more critical situation.

The regular cavalry has met the necessities of the lance combat fully; their lances are shorter and the rear rank man carries a sword.

It would be equally rational, in my opinion, to take away the lance from Cossack rear rank men—it should be replaced by a Yataghan bayonet capable of being fixed to the carbine.

With such an armament the rear rank men would be capable of fighting on foot: provided with a sufficiently long and solid arm, endowed with great agility, they would be in a condition to meet corps for corps, the infantry of the enemy.

One half of the front rank would act as pikemen, the other as guard to the horses. The pikemen, besides protecting the flanks, could in their turn, in case of extreme necessity, to be determined by rule, reinforce the fire of the line of battle or act in reserve. This portion would have no bayonets.

The composition of a regiment of Cossacks of 12 files per platoon,	
would give to act as infantry,	300 men.
Pikemen, (reserve and guard)	150 „
Guard over horses,	150 „
	<hr/>
	600

The pikemen could, in all cases, furnish 50 carbines to support the line of skirmishers.

NOTES ADDED.

Most recent returns give the strength of the Cossacks, as reorganized, to be :—

			Regiments			Horse Batteries.
OF 6 SQUADRONS	{	Don Cossacks...	62	...	...	22
EACH	...	Oral „	9	...	...	0
		Orenburg „	17	...	...	8
4 SQUADRONS	{	Semirjitschensk	3	...	...	0
EACH	...	Amur	2	...	...	0
		Astrachan	3	..	...	0
			<hr/>			<hr/>
			96 regiments of			30 batteries
			500 squadrons			of 180 guns.

N. B. Batteries of 6 guns.

Of the above in peace time about $\frac{1}{2}$ only are kept with the colours.

Weapons. The lance and broad Cossack sword constitute the cavalry armament.

Army Service. The Army service of the above is divided into 3 classes, viz :—

1. The preparatory class.
2. The active army.
3. The reserve.

On the completion of his 17th year the Cossack enters the preparatory class, and during the 1st year arranges for his own instruction and is exempt during it from personal duty. In his second year, his first military instruction commences in the “Stanitsa,” instruction which, combined with that of the larger units, is in the 3rd year brought to a conclusion.

Into the 2nd class of the active army those who have passed through the “preparatory class” are drafted. Its ranks supply the men required for peace service and those required for augmentations on mobilization.

During peace, the service exacted in this period is 4 years; on its conclusion the men are sent on furlough: during the first 3 years of the furlough they are called out for a collective yearly training of 3 weeks: during the succeeding 3 years, a 4th training takes place. During the furlough the Cossack on the active list must keep up an effective horse. After a service of 9 years in the active ranks the

Cossack passes into the Reserve. No peace duty is required of this Reserve—in war, part would be drafted to fill up gaps in service regiments and batteries, part for other duties, such as the home duties, scouting services (to various detachments of troops), &c.

The 4 foot battalions of the Amur army, of whom during peace 2 only do duty with the colors, are constituted after the same principle. The whole of the Cossack Troops are under the Crown Prince as Chief Ataman, and each section of it under a "Nakasuy Ataman" of whom one acts as General Staff Officer and Adjutant. The Staff of the Don Army is quartered in Novo Tscherkask, that of the Oral Army in Vral'sk, the Orenburg Army in Orenburg, the Semirjitschensk Army in Wjernoje, the Amur Army in Blagovjescht Kensk and that of the Astrachan Army in Astrachan. The higher commands of the Cossack Army will be entrusted to Russian Generals to be denominated Nakasuy Ataman; of these that of the Don Army will hold the rank of a Governor General.

The Cossacks of the Kuban, the Terek, of Siberia and Sabaikal Lande have not been re-organized. Their strengths are not here given.

III.

MEMORANDUM

ON THE

Principles upon which Sappers and Miners should be organised.

BY

LIEUTENANTS H. O. SELBY AND J. G. DAY,

Royal Engineers.

PART I.

Before we can say with any confidence what *principles* should guide us in organising Sappers and Miners in India, it is necessary to have a clear idea of what they are intended to do;—so that the first question that we have to answer is,

For what purposes do Sappers exist?

The answer to this is, we think,—They exist in order to supply any body of troops, with which they may be, with *skilled labour and skilled supervision*.
 The purpose of Sappers. If they do not supply *skilled labour*, we cannot see how they are superior to mere bodies of Pioneers, and it is, therefore, useless to officer them with Royal Engineer officers.

2. Again: as there is never likely to be more than one company of Sappers with a Brigade on active service (in the English organisation there is only one company to each Division), it follows that the *company* must then become a *unit*, and two companies must be just as separate from each other as two regiments, the officer commanding the company being *solely* responsible for the dress, pay, equipment, discipline, transport and general efficiency of his men, both as soldiers and professionally.

Now, if the company always is a *unit* in time of war, undoubtedly the best preparation is to make it so in time of peace: otherwise you send a company on service and make a complete change in its *government* and in the *responsibilities* of its commander when change is least to be desired, and you place upon the commander a quantity of new work when you wish him to be free from all avoidable trouble.

Herein, therefore, lies our first principle:—that companies of Sappers, to be most useful in war-time, should be *absolutely separate units* in peace-time, the Officer in command being solely responsible for their interior economy and instruction, and *not* liable to interference from any outside authority, except as regards Inspection.

3. It appears, also, that a company of Sappers (in order that it may be able to perform the various duties in war-time that it *should*), must be able to supply sufficiently strong working parties; so that the company must be strong. It should be at least 200 strong (in England the Field companies are

250 strong). It should be divisible into smaller working parties under efficient supervision, and, therefore, should consist of 200 men, with two native officers, six European non-commissioned officers, and three British officers.

4. As the *Senior Royal Engineer Officer* with any body of troops Under the command of is responsible to the General commanding for the C. R. E. the way in which the Engineering duties are performed, it is manifest that he must have the command of all the skilled labour as far as concerns the work to be done, and the time and method of performing it. The company or companies should, therefore, be under the command of the C. R. E., as Batteries of Artillery are under the C. R. A.

5. Should the officer commanding be responsible for the efficiency of his individual company, it is manifest that his native officers and men should not be *transferred* from one company to another, but that they should remain, as much as possible, in their own companies, similarly to men in regiments. This would be obtained by the *thorough unification* of companies.

6. If the companies are intended to do *skilled* work in times of war, it is evident that the more they are accustomed in times of peace to skilled work of the same nature the better.

Therefore, instead of being kept in one place and being drilled as an Infantry Battalion, they should be stationed wherever their services could be most effectively made use of in their own district or army corps command, and where they could be learning, practically, work that would be useful to them in war-time (say, on useful public works). By this means, the full war-strength of a company could be kept up during peace by the valuable work it might perform.

The principles of organisation. Let us now recapitulate the foregoing principles on which Sappers and Miners should be organised :—

- (1)—The companies should be units.
- (2)—They should be strong.
- (3)—They should invariably be under the orders of the C. R. E.
- (4)—They should be employed on skilled labour during peace-time.

If these principles are sound, two questions at once suggest themselves :—

- (a)—Is the present organisation of the Sappers in India in accordance with these principles ?
- (b)—If not, can a system be suggested which is ?

PART II.

(a).—Firstly, then,—“Is the present organisation in accordance with the principles laid down above? We answer to this,—“Certainly not.” The Sappers and Miners, as at present constituted, are simply Native Infantry Battalions, The present organisation unsuitable.

and, except for the superior scientific attainments of the officers and the European non-commissioned officers, rather inferior ones. The companies are :—

- (1)—Not units.
- (2)—Weak.
- (3)—Usually unaccustomed to much skilled labour.
- (4)—Kept at the so-called Head Quarters idle.
- (5)—Subject to constant transfers.

The officers commanding have little or no authority over their companies except when on detachment.

The evils produced by this state of things on active service are many and great.

The officer commanding a company has, then, suddenly put upon him the pay, clothing and equipment, (for which he was only in part responsible if he had been at Head Quarters). And while he is doing the *real work* of the company, he is constantly in trouble with the Head Quarters. It causes constant trouble with the Pay and Ordnance Departments, who, so long as Sappers are constituted as an Infantry Battalion, not unnaturally insist on dealing with it as such.

But, by far the worst evil that the present system produces is, that it tends to set up an "*imperium in imperio*," the officer commanding the Sappers being independent (and acting so) of his senior professional officer, the C. R. E., except in the case when the Sappers are formed into an Engineer corps, as provided for in B. A. R. § 254 *a*, a measure which has not been adopted during late campaigns. It tends to make the Sappers forget their "*raison d'être*," and to make difficulties about doing work instead of yielding ready and cheerful obedience. This latter evil has shown itself in the most notorious way in the campaign just concluded in Afghanistan.

PART III.

§(1)—(b)—If, then, the present system is wanting, can we not find a better.

The proposed organisation.

The system we would propose is as follows:—

- (1)—The total abolition of the three corps of Sappers and Miners as corps.
- (2)—The establishment of strong Companies, which shall, like the R. E. Field Companies at home and the Batteries of Artillery in India, be independent units.
- (3)—That there be a *depôt* formed at each Army Corps Head Quarters, with two officers in charge of a *depôt* company for the training of recruits. Also, a Park with an officer in charge.
- (4)—That there be appointed a Deputy Adjutant General for the Royal Engineers and Sappers at Army Head Quarters, to whom the company officers should be directly responsible.

(5)—That the companies be employed on useful Public Works during peace-time, except when going through courses of professional instruction.

§(2)—The company to consist of—

Strength. 3 British officers.
 6 British non-commissioned officers.
 3 Native officers.
 200 Rank and file.

§(3)—The Dépôt.

Dépôt. For the preliminary training of recruits, a dépôt company should be formed, from which trained Sappers should be drafted to each company as required; this company should be commanded by two European officers.

 There should be a Park attached to the dépôt, with one European officer in charge, who should issue to companies, as occasion would require, their equipment (as an ordnance dépôt does to Artillery); the equipment being laid down and made up in this Park.

 It should be arranged that the service companies should spend one year out of four at the dépôt, and stationed for the other three years at some other station.

 The *company officers* should instruct their own men, it being clearly understood that the permanent dépôt officers are not to interfere in any way with them, the dépôt being only a *place more convenient* for the *professional* instruction of the companies.

 The dépôt to be at Army Corps Head Quarters (if the recommendations of the Army organisation committee are to be carried out), when the dépôt company, and the company or companies under professional training, would be under the orders of C. R. E. of the Army corps.

§(4)—The present system of a large number of Royal Engineer officers detached all over India, without any
 D. A. G. R. E. military head, is a great evil, and should be rectified by the appointment of an officer to the Adjutant-General's Department, who would also be the officer to whom the Sapper officers would be responsible. At present R. E. officers have no representative at Army Head Quarters.

§(5)—The companies to be employed on Public Works. This
 Employment during should be under the orders of the C. R. E. of
 peace-time. of the Army corps in which the Sappers are serving.

 As regards the pay of Sapper officers, it would be better to increase the pay of all officers commanding companies,
 Pay of officers. so as to make it more attractive to those who, perhaps well-fitted in all respects to fulfil the duties, now go in for more lucrative appointments.

 This could be done without involving any extra expense to Government, as, if the staff officers of the corps are abolished, their pay could be divided among the officers commanding companies.

The above remarks are by no means the opinion of one individual member of the corps of Royal Engineers, but are, we are personally aware, the ideas of a great number of its members, of many who have served in Afghanistan and in other active service, and who have seen and remarked repeatedly the many evils and vexations the present organisation has caused.

We think, with many others, that the fault lies in the existing organisation, and not in the materials. Our only hope, in placing these poor opinions before your readers is, that some better system may be developed, or at any rate, that some radical change may root out and destroy for ever those faults which lead to heart-burnings and disappointments, and that chiefly to members of a corps which should be at least as distinguished as any other branch of the Military Profession.

" Quo fas et gloria ducunt."

April 1881.

IV.

EXTRACTS FROM RESUMÉ

OF

HORSE AND MULE BREEDING OPERATIONS IN INDIA, 1880.

SECTION I.

The Department of Horse-Breeding Operations under the Government of India was established in March 1876, and the developing of mule-breeding in India was subsequently taken up. The undermentioned officers were appointed to the department:—

Mr. J. H. B. Hallen, Staff Veterinary Surgeon (Bombay establishment), General Superintendent, Horse-Breeding Operations.

Veterinary Surgeon A. Queripel, A. V. D., Assistant Superintendent, Horse-Breeding Operations, Punjab, succeeded Vet. Surg. Meyrick, who succeeded Vet. Surg. W. Boyd.

Mr. E. J. Batt, 1st Class Veterinary Surgeon (Bengal Establishment), Assistant Superintendent, Horse-Breeding Operations, North-Western Provinces and Rajputana.

In the Bombay Presidency, Mr. W. Lamb, Inspecting Veterinary Surgeon, superintends the working of the Stud Department, and in Kathiawar, the Assistant Political Agent supervises the stud operations in that province.

In the Madras Presidency, the Government have no horse-breeding operations, but a system of mule-breeding has lately been inaugurated, and Mr. F. G. Shaw, Staff Veterinary Surgeon, has been directed to supervise.

The General Superintendent, Horse-Breeding Operations, under the orders of the Government of India, immediately supervises the operations conducted in the North-Western Provinces, Rajputana, Punjab and Lower Bengal, and advises on stud subjects of the Madras and Bombay Presidencies.

The two Assistant Superintendents of the North-Western Provinces and Rajputana and the Punjab, conduct their duties under the orders of the General Superintendent, who also consults the Local Governments on subjects connected with the provinces under the respective Lieutenant-Governors.

The Assistant Superintendents proceed on annual tours of inspection through the horse and mule-breeding districts of their respective provinces early in October, and, as a rule, complete their tours in the following April or May, and then return to their head-quarters; those of the Assistant Superintendent, North-Western Provinces and Rajputana, being at the dépôt stallion stables at Hapur, near Meerut, North-Western Provinces, and those of the Assistant Superintendent, Punjab, at Abbottabad, where the stallion dépôt of the Punjab is temporarily located.

During their tour they inspect all mares whose owners are desirous to have them branded, with the view of their obtaining the services of Government stallions; and they brand on the shoulder such mares as they consider fit for horse-breeding, with the letters V. I. in the North-Western Provinces and Rajputana, and B. M. in the Punjab. Formerly V. R. was the brand in use in the North-Western Provinces.

Pony mares, whose owners desire to have them mated to donkey stallions, are also branded on the shoulder with the letter D.

The Assistant Superintendents also attend as members and veterinary advisers on all committees at metropolitan horse fairs and district horse shows, where Government award prizes for the best of the different classes of stock. They also render professional advice to the Remount Agent, Upper Provinces, whenever that officer desires their veterinary opinion regarding stock, which he may propose purchasing for remount purposes.

They communicate personally, or by letter, with their respective Local Governments and civil officers, with reference to horse and mule-breeding subjects, advise horse-breeders, and carry on their duties under directions from the General Superintendent.

The stud operations in Bombay are conducted by Mr. W. Lamb, Inspecting Veterinary Surgeon, under the orders of the Local Government.

In Madras, the newly inaugurated system of mule-breeding is carried on by Mr. F. G. Shaw, Staff Veterinary Surgeon, under the orders of the Local Government.

Likewise in Lower Bengal, the Lieutenant-Governor issues orders with reference to the distribution of the donkey stallions.

SECTION II.

Horse-Breeding Operations—Stallions.

The number of stallions in the North-Western Provinces, Rajputana and Punjab, at present sanctioned, is three hundred. Great care is exercised in the selecting of horses best suited for improving the breeds in India.

They are of the following classes:—

English thorough-bred	...	...	...	...	82
Half bred English, including Norfolk Trotter	...	...	...	...	118
Australian	...	...	...	...	4
Cape	...	...	...	...	1
Arab	...	...	...	...	54
Stud-bred	...	...	...	...	50

Total ... 309

Of which ten or twelve will shortly be disposed of on account of age.

The English horses are purchased in England by Major-General A. R. Thornhill, under the orders of the Right Hon'ble the Secretary of State for India, according to indents submitted by His Excellency

the Viceroy in Council. The English horses are forwarded to India during the cooler winter months by troopships to Bombay, and thence by rail to the Hapur Depôt, where they are kept one year, in order to become acclimated and accustomed to the forage and grains of the country, prior to being distributed in the districts.

The Australian, Cape and Arab horses are purchased in India by the General Superintendent, under sanction accorded by the Government of India.

The stud-bred horses were received from the late Stud Department of Bengal.

The Government of Bombay obtain their English horses likewise from the Right Hon'ble the Secretary of State for India, and the rest are purchased by the Inspecting Veterinary Surgeon in the local market.

The number of stallions in Bombay, according to the last Annual Report, 1878-79, was as follows:—

English	...	...	...	...	...	...	8
Australian	...	...	...	...	...	...	1
Pegu	...	...	...	...	...	...	2
Arab	...	...	...	...	...	...	45
							<hr/>
Total							56
							<hr/>

The stallions are distributed and stabled in the several horse-breeding districts, viz: 66 in the North Western Provinces; 2 in Rajputana; 45 in the Punjab and 16 in Bombay.

In the allotting of stallions, those considered the best suited for crossing with the mares of the several districts, are selected and furnished. Moreover, in the North-Western Provinces, Rajputana and Punjab, the same class of stallions will, as far as possible, be continued in the same district, so that in due course of time, a sound judgment will be arrived at as to which class of sire proves the best suited for producing a superior stamp of horse.

Most of the stallions are kept in the depôt stables at Hapur (North-Western Provinces) and Abbottabad (Punjab) from June to October, during which months few mares are covered; a few only being left at the district stands to serve mares which may not have been ready for the horse in the more favorable months for mating.

In the month of October all the stallions, excepting the sick, are distributed throughout the districts, and their services are available for branded mares until the following June.

Practically, the covering season in the several parts of the North-Western Provinces, Rajputana and Punjab, continues from November to May or June. Foals dropped between the months of October and May are found to thrive best.

The depôt stables at Hapur are of a substantial and an excellent kind, being well situated, lofty and duly ventilated, consisting of spacious loose boxes, affording accommodation for one hundred stallions.

The depôt stables of the Punjab were, until recently, at Rawal Pindi; but on account of Ludhiana disease frequently attacking the army horses of that station, and the depôt stables not being in a healthy situation, the stallions in depôt are now stabled at Abbottabad, 4,166 feet above sea level, where Ludhiana disease seldom occurs. The Government of the Punjab have been pleased to place the Cavalry stables at that station temporarily at the disposal of this Department, pending the selection of a good site for depôt stables in some central position of the Punjab.

The stallions, when in the districts, are kept in stables, the property of the State, or rented. These stables consist of large well ventilated loose boxes.

Each stallion has a native groom, and is fed and cared for according to rules laid down. A reference to Appendix I, which is a copy of the rules for the care of Government stallions, will afford information as to the dieting, grooming, and general management of the horses. Translations in Urdú and Nagri are printed in juxta-position with the rules in English. A copy of the rules is suspended against the wall of every district stable.

SECTION III.

Branded Mares.

When the Department of Horse-Breeding Operations was established, the Government of India decided that only approved mares should be allowed the services of Government sires, and it was ordered that the branding was to impose no claim on either side, but to be the condition of using the Government stallion. This system had been in force some years in the Punjab, under the orders of the Local Government, and had been found to answer. Accordingly, the Assistant Superintendents of the North-Western Provinces and Rajputana and the Punjab, were directed to inspect, during their tours through the breeding districts, all mares brought or sent by their owners desirous to have them branded, so as to render them eligible for being mated with Government horses, and only mares considered fit for brood were to be branded.

The instructions conveyed to the Assistants were to the effect, to be particular in branding only those mares likely to give good stock, of a stamp fit for army and general purposes. Every mare so branded is then brought on the register:—

In the Punjab, as above indicated, the branding of mares on this system had been some years adopted.

At the present time, there are 9,275 branded mares borne on the registers.

In the North-Western Provinces and Punjab, respectively, there are 12 districts in charge of Native Inspectors.

To obtain information as to the results of coverings, also as to deaths or sales that may occur amongst the branded mares, so that any that have died or been sold, may be struck off the register, and thus as

accurate as possible a return of branded mares actually remaining may be obtained. The last returns show, as above indicated, 9,275 branded mares remaining on the registers.

It is found that the standard of branded brood mares is gradually improving, as many owners of good fillies, the produce of Government horses, keep them for brood purposes.

To assist breeders in obtaining mares for brood, the Government of India have been pleased to sanction that *all* mares, under 15 years of age, cast from British Artillery and Cavalry in Bengal and Punjab, may be sold by auction to *bonâ fide* horse-breeders, instead of allowing them to be sold to the public, and thus end their days in hack and post work.

Remount officers, and *all* officers in Government employ, whether in the military, civil, or other branches of the service, are forbidden, under orders issued by the Imperial Government, to purchase any mares or fillies branded with the letters V. R., V. I., and B. M., so as to allow these approved mares to remain as brood, and thus improve the breed of horses.

But in the case of a branded mare proving barren, the owner can obtain a certificate to the effect that she is barren, from the Assistant Superintendent, Horse-Breeding Operations, and then Remount officers and other officers in Government employ are at liberty to purchase the mare.

The Government hold no lien on branded mares or their produce by Government stallions, and their owners are free to keep, sell, or dispose of them as they like, save branded mares and fillies, to Remount and other Government officers as above explained.

SECTION IV.

Metropolitan horse fairs and district horse shows.

For some years past the Government of India have awarded money prizes at the horse fairs of Batesar and Hardwar in the North-Western Provinces, Rawal Pindi in Punjab, and Pokhur in Rajputana, and since 1877-78 the Government have instituted horse shows in the best horse-breeding districts, with the view of inducing owners to take good care of their stock.

At Metropolitan horse fairs prizes are annually awarded to the best stock of different classes shown by horse-dealers, as well as breeders, but at district horse shows, which also take place yearly, the money awards are granted to the best stock exhibited by breeders only, and the greater portion of the money is given to the best of branded mares and their produce by Government stallions.

Prizes are also given at all these fairs and shows to geldings, to induce owners of colts to have them castrated.

The results of this liberality on the part of the State are most satisfactory, as Judging Committees appointed by the Local Governments and Remount officers have generally recorded their opinions that the emulation on the part of stock owners, created by the awarding of

prizes, leads to the better care and management of horse stock, especially the brood mares and their produce, and thus facilitates the improving of the breed throughout the country, for without liberal feeding of the latter, the services of the Government stallions would be wasted.

It is intended by the Imperial Government to have khilluts, medals and honorary diplomas awarded in cases where exhibitors are desirous of abstaining from competing for money prizes with poorer exhibitors; or, in instances where Native States would prefer not entering their stock for competition.

During the year 1879-80 the sum of Rs. 16,500 was granted by the Government of India at fourteen horse fairs and district horse shows held in the North-Western Provinces, Punjab, and Rajputana.

SECTION V.

Veterinary School, Hapur, North-Western Provinces.

In order to afford assistance to owners in obtaining advice from qualified persons, as regards the treatment of sick and lame animals, and in having their colts properly castrated, and thus allow the latter to have more liberty and become better developed, a Veterinary School, under the Department of Horse-Breeding Operations, was established in 1876, and young men from the several horse-breeding districts are admitted for instruction, which is given without charge.

During the past four years 27 men have, after passing an examination, received certificates to the effect that they are qualified to practise as salutris and castrators.

Officers Commanding Native Cavalry have also sent men to study at the school, to become fit for the position of salutri in their respective corps.

Twenty districts in the North-Western Provinces, Punjab and Rajputana, have been supplied with salutris and castrators under sanction of the Government of India.

The services of eighteen advanced students of the school have been placed at the disposal of the Military Transport Train, Kabul Force.

With three exceptions, all the salutris issued from the school have been conducting their duties in a satisfactory manner.

District Committees of Muzafargarh, Rohtak, Ferozepur and Kurnal have also sent men to the school for instruction, to become qualified to act as advisers in the treatment of sick and lame horses and cattle of their respective districts.

As above stated, no fees are levied for instruction, but each student must provide himself with subsistence, or an allowance of Rs. 5 per mensem must be granted by his friends or District Committee who may send him to school.

Course of instruction.

Lectures on the common diseases and lamenesses of horses.

Clinical lectures, during which the symptoms of diseases and lamenesses are shewn, treatment recommended, and ordinary operations performed.

Preparation of prescribed medicinal remedies and the mode of administering or applying the same.

Horse shoeing.

Stable management, with a special reference to the prevention of disease, by adopting a sound system of watering and feeding stock, and due ventilation and sanitation of stables.

Nature, causes and symptoms of ordinary cattle diseases explained, and treatment recommended.

Students are rendered eligible for examination after a period of eighteen months' study from date of admission, and will be provided with certificates of qualification as salutrists and castrators on passing the examination.

Unsuccessful competitors are allowed a further term of twelve months to qualify themselves for a second examination.

No allowances will be made to the students during the period of tuition. They must support themselves.

The wages of a qualified salutrists and castrator in the Department of Horse-Breeding Operations are as follows:—

1st year of service,	Rs. 14 per month ;
2nd " "	15 "
3rd " "	16 "
4th " "	18 "
5th " "	and over, Rs. 20 per month ;

and every salutrists and castrator is required to provide and keep a pony for travelling through the districts.

Salutrists and castrators holding certificates of the Hapur Veterinary School, who may prove themselves zealous in the performance of their duties, will be recommended by the Department of Horse-Breeding Operations, as opportunity occurs, for higher paid appointments in connection with Municipal District Committees, &c.

A student can be admitted during any month of the year.

Permission to enter the school can be obtained from the General Superintendent, Simla, or Assistant Superintendent, Horse-Breeding Operations, North-Western Provinces and Rajputana, Hapur.

A practical treatise on the management of brood mares and young stock, and the symptoms, causes and treatment of ordinary diseases and lamenesses of horses, compiled by 1st Class Veterinary Surgeon J. J. Meyrick, is about being published under the sanction of the Imperial Government, and a copy of this book will be given gratis to owners of branded mares.

SECTION VI.

The practice of castration of colts has not hitherto been customary in India; partly on account of a belief that castration weakens a horse's powers of endurance, and partly on account of the gelding not being so high metalled and showy as the entire horse. But the most weighty objection to castration has been the danger attendant upon the operation, as, until lately, no qualified gelders were at hand, and the unfortunate horse was operated on by men who, from ignorance, very often caused the horse to die, either under, or from the effects of, the operation.

Since qualified castrators have been provided in the districts, and they have practically proved that there is little chance of a horse dying when properly operated on, owners are gradually gaining confidence and are bringing their colts to the salutrists, in order to render them eligible to compete as geldings for prizes at fairs and shows.

Out of 802 colts castrated between 1877 and 1880, only two have been reported as having died from the operation.

Moreover, dealers are now having colts castrated with a view of facilitating their breaking in, in harness as pairs, &c.

That castration is gradually increasing is also shown by the fact that between 1877 and 1879, 425 geldings were purchased as remounts.

To give further inducement for castration to become common, and thus allow greater chance of young colts having more liberty, and becoming thereby better developed, the following rules have been laid down:—

“Geldings may also compete in classes ‘Colts,’ and ‘Yearlings (colts).’

“On future occasions, prizes for geldings will be increased in number and value, and those for colts not castrated will be proportionately decreased. To enable a horse to become eligible to compete in the gelding class, *both testicles must have been excised.*

“The prizes allotted to the class geldings are to be invariably awarded to the best competing, irrespective of their worth in other respects. Prizes in this class to be awarded only to stock that have been castrated when in possession of their present owners, *bonâ fide* horse-breeders, and provided the Judging Committee are satisfied the animals have been castrated with a view of competing for the prizes.”

Colts, not castrated at, or soon after, eighteen months of age, become difficult to manage, and require more tethering, and frequently are tightly bound by head, fore and hind heel ropes, as well as cross ropes, and become more or less deformed in limbs, narrow-chested, in at elbows, and are thus ruined. Gelding colts become quiet, and are as easily managed as fillies, and, like the latter, having more liberty, become better developed and stronger in body and limbs.

By inducing castration of colts the using of the Government stallions becomes more certain, and thereby improvement in stamp is rendered more likely.

SECTION VII.

The following table shows the number of country-bred remounts purchased during the last three years by the Government Remount Agent, Upper Provinces, for British Artillery and Cavalry, and by Remount officers of Bengal and Punjab Native Cavalry and Police:—

YEARS.	For British Artillery and Cavalry.	For Bengal Native Cavalry.	For Punjab Native Cavalry.	For North-Western Provinces and Punjab Police.	Total	REMARKS.
1877-78	72	704	203	221	1,200	
1878-79	88	1,751	556	211	2,606	
1879-80	117	*	*	129	*	* Returns not complete.
TOTAL	277	2,455	759	561	3,806	

The Government of India have ordered that two hundred remounts be purchased during the current year for British Artillery and Cavalry, and it may be expected that a larger number will become annually obtainable as Indian horse-breeding develops and the breeds of horses improve.

A home supply of horses is, of course, a desideratum for many reasons, the chief being to have Indian-bred horses at hand, and the fact of the money spent by the State and public in purchasing horses remaining in the country, is a very important revenue matter.

Some purely country bred horses being found in the Punjab and Rajputana quite fit for army purposes, augurs favorably for Northern India to produce, in time, by selected sires and dams and due culture of young stock, all the horses required by the State and public.

SECTION VIII.

Mule-Breeding Operations, North-Western Provinces and Punjab.

For some years past mule-breeding has been carried on in the Punjab, and fostered by the Lieutenant-Governor.

It is found a remunerative occupation, and has been increasing during the last few years.

In the North-Western Provinces and Rajputana the industry has not been earnestly taken up by mare-owners; but during the last two years some success has been attained in inducing owners of the smaller and indifferent mares to mate them with the donkey.

At the present time ninety-one donkey stallions are distributed in the several districts of the North-Western Provinces and Punjab.

Their services for mares are obtainable gratis. They are of the following classes :—

Spanish	...	...	...	...	...	...	4
Arab	...	...	...	...	...	...	75
Bokhara	...	...	...	...	...	...	10
Punjabi	...	...	...	...	...	...	2

Total ... 91

Mule-breeding is spreading so much, especially in Punjab, that there is a steadily increasing demand for the services of more donkey stallions; indeed, the demand is greater than at present can be supplied, but measures are being adopted by the Department of Horse and Mule-Breeding Operations, so as to obtain a sufficient number of superior animals as soon as possible.

It is expected that Arab dealers will import seventy to eighty from Arabia this year; a few of Kabul breed may be obtained, and the Deputy Commissioner of Dehra Ghazi Khan has kindly promised to procure

some from the Bozdar hills in Biluchistan, where a hardy and well-limbed donkey, of good size, is bred. It is also proposed to have some provided from Egypt, where, it is well known, a very superior class of donkey is found.

Occasionally a suitable donkey sire is bought in the Punjab, as the fact of mule-breeding having proved so remunerative, has caused the breed of donkeys to be improved, and by and by a good supply of donkey stallions may be expected from these provinces.

SECTION IX.

A system of branding horse and pony mares with the letter D on the shoulder, for mule-breeding, has been adopted, so that the number of mares employed may be registered and known. This brand secures the mare the service of the donkey, free of charge; but in order to afford every chance of this industry rapidly developing, mares not branded are, for the present, allowed to be brought to the Government donkey sires. This was deemed advisable, as the desire to utilize mares for mule-breeding has latterly been so much on the increase; and unbranded mares, so served, will in due course receive the brand.

Branding has not been commenced in the North-Western Provinces as at present the mares brought to the donkeys are limited, and it has been thought prudent to allow no chance of impediments occurring in inaugurating the industry.

In the Punjab 1,599 horse and pony mares are registered, but very many more are being used as mule-breeders.

Approved donkey mares of a superior stamp are also branded with the letter D, as the frank for mating with Government donkeys, so that the local breed, which is the best in India, may be improved and donkey sires be obtained in greater abundance from this source.

SECTION X.

As above indicated, mule-breeding is found a paying occupation.

Doubtless, the better the horse or pony mare put to a good donkey, the better the produce which may be anticipated; but indifferent horse and pony mares, quite unfit to be mated with horses, are, when put to a good donkey, found to produce good and useful mule-stock.

Good mules at the side of their apparently worthless dams can be seen at the Rawul-Pindi fair; thus mule-breeding does not require much capital, as the dams are to be obtained at a low figure, and the cost of keeping them and rearing their hardy mule produce is inexpensive.

Mule-breeders do go to some little expenditure for a few weeks, in feeding their animals up to look and sell well at a fair, but this money is well laid out, as is shown by the prices which mules bring in the market.

At the annual Rawal-Pindi fair in March, from six to eight hundred mules are generally found for sale, and the excellent condition they are invariably in, attests the care bestowed on them to make them fit for market.

During the last four years, the following prices were realized by sales at this fair:—

YEARS.	Highest price.	Lowest price.	Average price.	REMARKS.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1876-77 ...	157 0 0	17 0 0	131 12 6	
1877-78 ...	300 0 0	16 0 0	129 0 0	
1878-79 ...	380 0 0	14 0 0	159 0 0	
1879-80 ...	*	*	191 16 6	* Returns received but not complete. It is believed Rs. 500 was the highest price.

Mule-breeding is a most useful adjunct to horse-breeding, in utilizing all mares not good enough to produce horse stock, and breeders of the poorer classes can enter upon it, as requiring little capital and bringing much remuneration. It may be considered, at present, the most paying of all agricultural industries, and it is likely to remain a remunerative occupation, as the demand by the State for mules for Government transport work, and by the public for pack purposes, especially in the hilly districts, will remain sure.

SECTION XI.

Government, in addition to furnishing donkey stallions gratis, offer other inducements to mule-breeders.

Prizes are awarded at the several Metropolitan horse fairs and district horse shows for the best of mules exhibited. Latterly prizes have also been offered to the best donkeys for mule-breeding purposes.

The purchases of mules by Government at Rawul Pindi are extensive. The average price paid by Government for mules purchased at the fair of 1878-79 was Rs. 219 each, and in 1879-80 Rs. 230 each.

Horse and pony mares are allowed to be served by the Government donkey stallions during any month of the year, so as to give every chance of adding to mule stock. The young mules being hardy, generally thrive, though dropped at seasons when young horse stock would probably not do well.

SECTION XII.

Mule-breeding in other Presidencies and Provinces.

At the suggestion of the Imperial Government a system of mule-breeding was inaugurated by the Government of Madras in 1879, and it is hoped that pony mare owners of suitable districts will, on finding mule-breeding a paying pursuit, follow it.

Up to last year, no mules had ever been bred in that Presidency, so time will be required to allow of the experiment being carried out.

Ten donkeys have been sent to Madras, and they have been distributed in six districts.

Prizes are to be awarded to the owner of every mule dropped for the first two or three years, and then prizes for the best of mule stock of different ages will be annually given.

The Government of Bombay are also adopting measures with the hope of introducing mule-breeding in that Presidency, and as the Deccan ponies are famed for their powers of endurance, a good field is offered in the highlands of those districts, especially as most of the stallion ponies have been purchased and sent for transport work to Afghanistan.

Five donkey stallions, under the sanction of the Imperial Government, have been provided to the Government of Bombay, to commence the experiment.

The subject of mule-breeding has been recently under the consideration of the Lieutenant-Governor of Bengal, and three donkey sires are being sent there.

Though the low lands of Lower Bengal are not favorable for the breeding of equine animals, still it may be hoped that some good mules may be bred and reared on the higher lands, especially in the hilly tracts.

Again, on the recommendation of His Excellency Sir Neville Chamberlain, Commander-in-Chief, Madras, to have mules bred for Army purposes, not only in Madras but also in Burma, proposals have been made by the Chief Commissioner, British Burma, to receive donkey stallions for mule-breeding, which pursuit, it appears, has been for some time adopted in some parts of Burma without British territory.

Two donkeys are to be sent there.

Correspondence has taken place between the Chief Commissioner, Central Provinces, and General Superintendent, Horse-Breeding Operations, on the subject of introducing and fostering mule-breeding on the highlands of those provinces, which it is thought will prove very suitable for the experiment.

The General Superintendent intends visiting Pachmarhi in September 1880, to confer with the local authorities on the subject.

SECTION XIII.

As the breeding of mules requires little capital, and is found remunerative, it may be expected that wherever the industry may be fairly started and fostered in suitable districts, success will result.

Native farmers and ryots are always loath to embark in any new pursuit, unless they see a good chance of profit; but when they become convinced that the profit is as sure as that of other occupations, they are not slow in taking to the new pursuit, especially if they find the profit connected with it is greater: hence why mule-breeding is spreading so rapidly in Punjab.

In some districts objections are raised on moral grounds; for example, in the Ajmere district the people look upon mule-breeding as against the proper course of nature, and it is believed that in Kathiawar similar reasons have been assigned for not adopting it.

These objections will gradually succumb to the influence of the profit to be derived by allowing horse and pony mares to become mule-breeders.

SECTION XIV.

The principles of the department now being carried out by the Imperial Government, with reference to horse and mule-breeding as a portion of agricultural operations, are :—

- 1stly.—To supply gratis the best suited stallions for approved mares, and thus to afford every chance of improvement in breed.
- 2ndly.—To award prizes at metropolitan horse fairs and district horse shows to the best of stock exhibited by dealers and breeders; and at district horse shows to allow only the produce of Government stallions out of branded mares to compete for the prizes which are reserved for breeders only: thus to induce owners to duly feed and care for their animals, and thereby materially assist in the production of an improved stamp of stock.
- 3rdly.—The providing of salubris and castrators to breeding districts, to render advice to owners of stock as to the treatment of their animals when sick or lame, and to castrate colts gratis, to allow of their being as easily managed and reared as fillies, and to have, like the latter, as much liberty as possible.
- 4thly.—To afford veterinary instruction gratis to all desirous to learn, with a view of veterinary aid becoming available in all breeding districts.

The distributing gratis, of Mr. Meyrick's Veterinary Guide and Manual, on the management and care of brood mares and stock, to owners of approved and branded mares.

That the liberal assistance thus granted by the State is being attended with success, is obvious by the better care bestowed by owners on stock, and the improvement in the stamp of horses which has already been found; therefore, there is reason to believe that by the Government of India steadily following the lines laid down, this important portion of agriculture will ultimately produce a sufficient number of good and useful horse and mule-stock, fit for the Indian army and for the requirements of the public. Moreover, agricultural interests will be improved by horse-breeders receiving all money spent in India on horses, instead of a large amount being sent, as now obtains, to Australia and other countries for imported stock, to the loss of Indian horse-breeders and to the detriment of the revenue of the country.

SIMLA, } J. H. B. HALLEN,
28th June 1880. } *General Supdt., Horse-Breeding Operations.*

P. S.—In the North-Western Provinces, Punjab and Rajputana, owners of branded mares are furnished with certificates of the date of serving by the Government stallions, also with another certificate of the date of birth, sex, color, &c., of the produce, so that purchasers may become possessed of the pedigrees of stock.

Dealers can obtain the latter certificates when purchasing young stock from breeders.

Remount officers and other purchasers are solicited to invariably obtain the certificates of pedigree, in order that opinion may be arrived at as to the value of the different classes of stallions as sires.

J. H. B. HALLEN.

APPENDIX I.

Rules for the care of Government Stallions.

I. The stable windows, and all apertures (ventilators) in the walls, below and above, and through the ceiling, should always be kept open.

Between the hours of 10 A. M. and 4 P. M. during the hot months, when flies are troublesome, and in the winter nights when the air is cold and chill, the chicks of the doorways should be let down.

II. The floor of the stalls should always be kept clean and level.

Dung and urine to be immediately removed, and dry earth placed upon the part where urine has fallen.

The evacuations, soiled portion of the bedding, and foul earth of the floor, should be thrown at a distance, to prevent offensive smell reaching the stable.

If these precautions are not strictly observed, the stallions are liable to get sick and their feet diseased.

III. A sufficient quantity of bedding must be provided, to enable the stallions to lie down comfortably.

Every morning the bedding should be exposed to the sun to dry.

When the bedding gets old, it should be thrown away, and replaced by a fresh supply.

IV. To prevent other horses coming into the stallion stable compound, a strong gate should be erected, and walls (not less than five feet high) built around the compound.

V. Stallions, when in the stable, are not to be tied up, except when being groomed.

Head and heel ropes are not to be used.

The doorways of the stalls should be fitted with strong gates.

VI. Stallions should be watered three times a day, and should not be fed till half an hour after watering. A horse when watered soon after eating grain, is very liable to get gripes.

VII. A stallion should receive the following rate of rations per diem :—

Four seers well crushed gram or barley, or half and half of each.

One seer bran.

Twenty seers green (doob) grass.

Five seers lucerne

Two seers carrots

} when procurable.

If the horse can eat more than twenty seers of green grass, it should be

given to him.

VIII. Stallions should be well groomed, with the brush, twice a day.

The brush is to be cleaned with the curry comb.

The curry comb is not to be applied to the horse.

When a horse is not properly groomed, he is liable to have skin disease.

IX. Stallions should not be bathed or washed, as either one or the other is likely to produce rheumatism and weakness of the loins.

X. Stallions to have about two hours of fast walking exercise, morning and evening, at a place unfrequented by other horses.

XI. During the summer months, when the stables are hot at night, the stallions should be picketted out in the stable yard (surrounded by a wall or rail fence) tied by the head only, from 7 P.M. to 4 A.M.

Heel ropes are not to be used in picketting the stallions.

XII. Stallions are to be shod when shoes are deemed necessary.

When shod, the shoes should be removed, the feet duly reduced, and the old or new shoes applied, once a month.

XIII. A stallion should not be allowed to serve more than twice in one day (either one mare twice, or two mares, once each), *viz.*, once in the morning and the other in the evening.

He is not to cover more than five times during the week.

He is not to serve more than 50 mares during the year without the sanction of the Assistant Superintendent, Horse-Breeding Operations.

When a mare is being covered, both her hind-legs and one fore-leg should be hobbled in the usual way.

XIV. Only mares that have been inspected, branded V. R. and B. M. and registered, will be served by the stallions.

It is strictly forbidden to allow any other mares to be covered by Government stallions.

Mares branded V. R. and B. M., but under five years of age, are not to be served.

XV. No fees of any kind are to be given or received.

The Government stallions are allowed to cover V. R. and B. M. branded mares gratis.

Zilladars and stallion-keepers are strictly forbidden to receive any fees directly or indirectly from the owners of mares.

XVI. In the event of a stallion becoming ill or getting injured, a report regarding his state should be submitted to the Assistant Superintendent, Horse-Breeding Operations.

Should the sickness or injury be of a serious nature, and the stallion fit to be moved, he should be at once sent to the dépôt hospital for treatment.

If any stallion is found to be weak, he should not be allowed to serve, and a report regarding his state should be submitted to the Assistant Superintendent, Horse-Breeding Operations.

When a stallion is found not to fill his mares, the circumstance should be reported to the Assistant Superintendent, Horse-Breeding Operations.

Stallion-keepers should always have ready at hand the usual colic mixture* and an enema pipe by them, so as to be able to treat such stallions as may get gripes.

The mixture to be given as directed.

As long as the symptoms of gripes continue, clysters of tepid water and oil should be administered.

J. H. B. HALLEN,

Genl. Supdt., Horse-Breeding Operations.

APPENDIX II.

Rules for the guidance of Judging Committees of Metropolitan Horse Fairs.

I.—Only *bond fide* horse-breeders and dealers will be allowed to compete for the above prizes. The stewards will decide as to the eligibility of competitors.

II.—As permission has been accorded for all fillies four years old (but not under) to be served when in æstrum by Government stallions, so a mare of four years of age in foal, or with foal at foot, the result of having been covered before four years of age, will not be eligible to compete.

III.—Geldings may also compete in Class IV—"Colts" and Class V—"Yearlings" (Colts).

IV.—Government horses will not compete, nor will Government claim the right of purchasing any stock exhibited.

V.—Intending exhibitors should, on arrival at the fair, apply to the Secretary of the Judging Committee for a ticket or tickets, as the case may be, stating the class in which they propose to compete.

VI.—Each ticket will be worn by the animal as a token of the right to compete, and of the seller's right to the prize, if sale is effected before the awards are made. By careful attention to this rule, the owners will be secured against losing the chance of a prize.

VII.—When the tickets are given, the Secretary will name the date, hour, and place at the fair, when and where horses should be brought for examination. A shamiana, or large tent, or shed, to afford shade to the Committee, within a temporary rail enclosure, should be erected to allow of the members to carefully examine the stock. The public should not be permitted to enter the enclosure during the Committee's proceedings.

VIII.—Prizes will be awarded the day before the bathing day, where one is appointed.

IX.—A certificate (parwana) will be given to each winner, whether he takes his prizes in money, khillut, or medal, as he may think best.

X.—Honorary certificates will be awarded to exhibitors who are not *bond fide* horse-breeders and dealers, and who may show superior animals. On the certificate may be noted the prize and money value that would have been awarded to the animal had the owner been *bond fide* horse-breeder or dealer.

* Linseed oil 4 chittacks, turpentine 1 oz., laudanum 1 oz., to be well shaken before given.

XI.—A Committee of experienced officers appointed by the Local Government, will act as Judges. The Assistant Superintendent Horse-Breeding Operations of the Province, will attend the Committee as member and veterinary adviser. In his unavoidable absence the services of a veterinary officer will be provided under the orders of the Government of India.

XII.—Discretion is to be used by the Judging Committee in awarding only a portion of prizes to any class if the stock of that class be not considered worthy of all prizes noted, and the money not awarded may be devoted to the giving of extra prizes in other classes deemed by the Judging Committee as worthy of them, as it is the desire of Government to award the total sum granted, provided any of the classes of stock competing are in any way worthy of it.

XIII.—The system of marks will be adopted as follows:—

For Mares.

					Marks.
Soundness	...	...	...	...	25
Power	...	...	...	...	25
Quality	...	...	...	...	25
Produce (if any)	...	...	...	...	25

Total ... 100

If no produce the total will be ... 75

All other stock.

					Marks.
Soundness	...	...	...	...	25
Power	...	...	...	...	25
Quality	...	...	...	...	25
Action	...	...	...	...	25

Total ... 100

Marks for "action" have not been accorded to mares, as some competing may be too heavy in foal to allow of their action being shown. The Judging Committees are requested to be good enough to attach a return to their reports, showing the number of the several marks allotted to winners of prizes.

Notes.

1. On future occasions, prizes for geldings will be increased in number and value, and those for colts not castrated will be proportionately decreased. To enable a horse to become eligible to compete in the gelding class, both testicles must have been excised.

2. The prizes allotted to the class "Geldings" are to be invariably awarded to the best competing, irrespective of their worth in other respects. Prizes in this class to be awarded only to stock that have been castrated when in possession of their present owners, *bond fide* horse-breeders, and provided the Judging Committee are satisfied the animals have been castrated with a view of competing for the prizes.

3. When mares, late of the Kurnal home-stud, sold in different districts in the North-Western Provinces and Punjab, are brought to compete for prizes, the Judging Committee are empowered to make a separate class of these, and to give one or two awards to the best shown from the sums allotted to the class "Mares," or from money not expended in other classes.

Rules for the Guidance of Judging Committees of District Horse Shows.

I. Only *bond fide* horse-breeders of the districts named will be allowed to compete for the above prizes. The Judging Committee will decide as to the eligibility of competitors.

II. Branded mares not served by Government stallions within one year of date of show are debarred from competing. This rule does not apply to "branded fillies" of four years of age, as they are not allowed to be covered by Government stallions until four years old. A mare of four years of age, in foal, or with foal at foot, the result of having been covered before four years of age, will not be eligible to compete.

III. No mares or stock will be allowed to compete "as served by Government stallions" or "got by Government stallions," unless a certificate to the effect is produced by the exhibitor. These certificates are obtainable from officers in charge of stallions.

IV. Branded fillies (class II) if out of branded mares by Government stallions, may also compete in "Class III—Fillies."

V. Geldings (class VI), if out of branded mares by Government stallions, may also compete in "Class IV—Colts," and "Class V—Yearlings" (colts).

VI. Intending exhibitors should, on arrival at the show, apply to the Secretary of the Judging Committee for a ticket or tickets, as the case may be, stating the class in which they propose to compete.

VII. Each ticket will be worn by the animal as a token of the right to compete.

VIII. When the tickets are given, the Secretary will name the date, hour and place at the show, when and where horses should be brought for examination. A shamiana, or large tent, or shed, to afford shade to the Committee, within a temporary rail enclosure, should be erected, to allow the members to carefully examine the stock. The public should not be permitted to enter the enclosure during the Committee's proceedings.

IX. Prizes will be awarded on the day appointed by the President of the Judging Committee.

X. A certificate (parwana) will be given to each winner, whether he takes his prizes in money, khillut, or medal, as he may think best.

XI. One or more of the district officers of each district represented, and the Assistant Superintendent, Horse-Breeding Operations of the Province, will act as judges of the Committee.

XII. Discretion is to be used by the Judging Committee in awarding only a portion of prizes to any class, if the stock of that class be not considered worthy of all prizes noted; and the money not awarded may be devoted to the giving of extra prizes in other classes, deemed

by the Judging Committee as worthy of them, as it is the desire of Government to award the total sum granted, provided any of the classes of stock competing are in any way worthy of it.

XIII. The system of marks will be adopted as follows:—

For Mares.

					Marks.
Soundness	...	...	...	...	25
Power	...	...	...	...	25
Quality	...	...	...	...	25
Produce (if any)	...	...	...	...	25
Total					100
If no produce, the total will be					75

All other stock.

Soundness	...	...	...	...	25
Power	...	...	...	...	25
Quality	...	...	...	...	25
Action	...	...	...	...	25
Total					100

Marks for "action" have not been accorded to mares, as some competing may be too heavy in foal to allow of their action being shown. The Judging Committee are requested to be good enough to attach a return to their reports, showing the number of the several marks allotted to winners of prizes.

Note.

1. On future occasions prizes for geldings will be increased in number and value, and those for colts not castrated will be proportionately decreased. To enable a horse to become eligible to compete in the gelding class, both testicles must have been excised.

2. The prizes allotted to the class "Geldings" are to be invariably awarded to the best competing, irrespective of their worth in other respects. But prizes in this class to be awarded only to stock that have been castrated when in possession of their present owners, *bond fide* horse-breeders, and provided the Judging Committee are satisfied the animals have been castrated with a view of competing for the prizes.

3. When mares, late of the Kurnal home-stud, sold in different districts in the North-Western Provinces and Punjab, are brought to compete for prizes, the Judging Committee are empowered to make a separate class of these, and to give one or two awards to the best shown from the sums allotted to the class "Mares," or from money not expended in other classes.

APPENDIX III.

GOVERNMENT OF INDIA.

HORSE-BREEDING OPERATIONS DEPARTMENT.

This is to certify that _____
 of _____ has attended the Veterinary School at
 Baboogurh, near Hapur, North-Western Provinces, India, from _____
 to _____, and having passed an examination on
 _____, is considered qualified to perform the duties
 of Salutri and Castrator.

BABOOGURH, NEAR HAPUR, }
 NORTH-WESTERN PROVINCES, }
 The _____ 18 . }

Assistant Supdt.
Horse-Breeding Operations,
N-W. Provinces & Rajputana.

Countersigned.

General Superintendent,
Horse-Breeding Operations.

V.

VICTUALLING OF THE FRENCH ARMY IN ALGERIA,*

From the Russian of Captain (now General) Kuropatkin,

OF THE IMPERIAL RUSSIAN ARMY,

TRANSLATED BY MAJOR WALTER E. GOWAN.

Articles composing man's food—their classification and composition—drinks—normal food†—conditions which the food of a soldier should fulfil—articles entering into the composition of the food of the French soldier—qualities required of them—normal quantity of daily food of one man—articles included in the ration allowance and those which he buys himself—money allowed for the victualling of the rank and file—receipts and expenditure—part taken by the Intendance in the provisioning of the troops—food of the Algerian army in quarters—food of the non-commissioned officers—soup, bread, coffee—cost of the yearly rations of the soldier—food on the march—biscuits—food of the officers—conclusion.

For the support of man's organism, there must enter into his food and drink 310 grammes (about 11 oz.) of carbon and 130 grammes (about $4\frac{1}{2}$ oz.) of azotic particles, equal to 20 grammes (about $\frac{3}{4}$ oz.) of azote. On this basis the French have arranged the following as the normal ration of a man‡.

		Oz.	Azotic particles.	Gr. carbon.
Wheaten bread	1,000 grammes	(35 about)	70 gr.	300.
Meat	268 „	($9\frac{1}{2}$ „)	60.26	31.46
	1,268 „	($44\frac{1}{2}$ „)	130.26	331.46

Into this normal ration there enter both vegetable and animal food.

Experience shows that, although with the use of exclusively vegetable or animal food, a man can exist, yet the theoretical ideal of food is such that it should be mixed and varied and changeable in proportions that will constantly depend on growth, temperature, climate, quantity of work done, &c.

As affecting troops, the question as to food is brought under three conditions: (1) the food of the army must be *wholesome in its composition*, (2) *sufficient as to quantity*, and (3) *cheap*.

* A chapter in a work on Algeria, which is of special interest at this present time.

Translator.

† Information embraced under the first five headings of this chapter is omitted in order to curtail the length of the present translation. Translator.

‡ Langet "Traité de Physiologie." Author.

The other conditions of food, as worked out scientifically, are either applicable to an army in an inconsiderable degree, or are wholly inapplicable.

Thus, the food of soldiers can be varied only within very confined limits. To change their food according to their respective growths, temperaments, and the amount of work which each one may do, is not possible, and would be superfluous, because the conditions for the greater number of men are the same. The necessity for altering a soldier's food according to the climate is a somewhat more serious question. But in practice the fulfilment of this condition is met by insuperable difficulties. In comparatively small France the climate of Brittany differs from that of the south of France, whilst the climate of that again differs from the climate of the portions of the Sahara occupied by French garrisons. In practice, the greater proportion of soldiers in all climates and under all conditions always receives one and the same sort of food.

We have seen above that the French recognise the daily allowance of food as being sufficient in quantity and wholesome in quality if it, in a gross weight of 1268 grammes ($44\frac{1}{2}$ oz.), contains 268 grammes ($9\frac{1}{2}$ oz.) of meat and 1000 grammes (35 oz.) of wheaten bread. During the past year the daily issue of meat to French soldiers amounted to 300 grammes ($10\frac{1}{2}$ oz.), so that, with one fast day during the whole year, the average daily allowance was $\frac{3}{4}$ lb. The French consider this large allowance of meat to be indispensable, especially of late, when, with universal conscription, there have entered the ranks of the army many thousand soldiers still physically undeveloped. Thus the final development of the organism of recruits received from the agricultural and trading classes goes on, on service, during a period of from 21 to 25 years. Meanwhile no sort of food can compete with meat in its capacity for forming and rapidly establishing the organic forces*.

Passing to the last condition which the food of a soldier must fulfil, that of cheapness, we find that this condition is always at variance with the first two. However important may be the question as to the cheapness of food, it may be observed that, with the large budgets of modern armies, almost 25% of the expenditure is set apart for the feeding of the troops. Every apparently inconsiderable addition of 1 farthing per day per man will, in an army of 7,00,000, amount in the year to an increase in expenditure of about £3,00,000. Nevertheless that expenditure incurred for provisioning the army cannot be regarded as the most unproductive which acts favourably on the health of the soldiers, on the number of those who fall sick in time of peace, and which, in time of war, lowers the always large percentage of those who fall out of the ranks *before* the battle.

The more or less perceptible expenditure of millions allowed for the food of soldiers depends on the greater or less thought out and final organisation of the Intendance department of the Army. Before proceeding now to an examination of this organisation in France, we

* "Nouvelles Sur la Chimie." Trad, Gerhard, Paris, P. 202. Author.

will first of all explain the theoretical position common to the whole of that country, and then pass to an examination as to how far this position is practised in Algeria.

The articles forming the State allowances to the French soldiers are classified thus: (1) ration of bread, (2) articles allowed in time of war, (3) spirituous liquors. To the first relates the usual amount of bread and biscuits; to the second, fresh beef and salted meat, salted hog's lard, rice, dried vegetables, sugar and coffee; to the spirituous liquors belong wine, beer, cider, and *vodka** (brandy or whiskey).

The stipulated quality of the several articles comprising the rations of the troops, the French have regulated thus†:—

(1) *Bread.*

(a) Of wheaten flour of the best kind. This bread must, in whiteness, correspond with bread of the 1st and 2nd sorts in private bakeries. It must be thoroughly baked, the crumb dry, light, elastic and not crumbly. The upper crust must not be separate from the crumb, must be smooth, fine, of an even dark yellow colour, without bubbles or crevices. The inner crust must be of a dark colour, and in thickness should not exceed 4 millimetres (0·157 inch.) The bread must be savoury, have an agreeable smell and be appetising to the sight. The smell of bread can be better judged if it be cut open when hot. On the other hand its whiteness can be best ascertained after it has cooled down.

(b) Bread of wheaten flour of inferior kind cannot possess all the above mentioned qualities to the full. Thus, its crumb will be a little moist and will contain holes, and it will not be so easily moistened on being dipped into soup. Its crust, too, is of a darker colour.

Each loaf must be fit for issue within from 16 to 24 hours after being taken from the oven. A loaf of this kind will weigh 1½ Kilogrammes (3 lbs.) i.e. will equal two rations.

During the hot weather bread can be kept for three days at a temperature of 10 degrees‡.

(2) *Biscuits.*

These are made of flour of the best sort—that which is richest in azotic particles. In the making of these biscuits neither yeast nor salt is used.§

Biscuits should not be brought into use before 15 days have passed after their manufacture. They can be kept without spoiling for one year. A good biscuit is known by the following signs—its outer surface

* I have never come across a systematical compilation of information and regulations relating to the victualling of French troops, like, for example, our "Interior economy of a company." I have, therefore, had to prepare the first portion of this chapter from several sources, orders and supplements. The second portion I have drawn up from elicited information and observations made at various points of Algeria, where I had an opportunity of noticing the food of the troops both in barracks, camp and on the march. Author.

† Addition to the order of 26th May 1866. Author.

‡ In the making of bread, salt is used in quantities from 3½ to 4 Kilos (7 to 8 lbs.) for every 1000 rations. Author.

§ Latterly they have begun to add both. Author.

is smooth, its interior of a pale yellow colour, without bubbles. On being knocked together biscuits should give forth a ringing sound and should be dry in the highest degree. An examination of their inside should reveal a compactness of paste. They should not crumble, should swell in water, their odour should be agreeable and their flavour slightly saline.

(3) *Fresh Beef.*

The respective qualities of good and bad beef are as follows:—

Good beef has a decided dark red colour and a peculiar, though not altogether agreeable, smell. It should be soft and slightly veined with white fat. That which has been recently cut up should contain a certain amount of blood. The muscles should be firm, the fat (more or less abundant) and marrow, solid and of a pale yellow colour. Cow's flesh differs somewhat from that of the ox; it is paler and the fibrous parts are less firm, the fat white rather than yellow. The bones, too, are finer and less massive. A cow's frame is more slender but wider than that of an ox.

Mutton is of a dark red colour and firm. An abundance of fat is one of the signs of good meat.

Beef of bad quality is distinguished by its pale red, blue or even black, colour. The flesh of such is dry or without a proper amount of fat, and sticks to the finger on being pressed. Such fat as there is on it resembles congealed oil. The marrow is found to be in an almost liquid condition. If the animal were old the colour of its flesh will be dark, muscular, dry and hard, whereas that of too young an animal will be of a pale rose colour, soft and spongy. The marrow will be of slight density. Meat which is decomposing is covered with spots of various hues besides emitting a bad smell. Meat should not be served out until 12 hours after the animal has been slaughtered. If circumstances require the issue of beef whilst it is still warm, the allowance must be somewhat increased. If the full amount of ox flesh cannot be issued the deficiency should be made up thus, $\frac{2}{3}$ ths ox flesh and $\frac{1}{4}$ th mutton, or $\frac{1}{2}$ ox flesh and $\frac{1}{2}$ cow's or $\frac{2}{3}$ ths ox flesh, $\frac{2}{3}$ ths. cow's and $\frac{2}{8}$ ths. mutton.

(4) *Salt meat.*

This is prepared from good ox flesh or pork that is not too fat, in weight from 50 to 150 Kilos (105 to 315lbs.). The thickness of fat on the back should not be less than 3 centimetres (1.18 inch) and not more than 7 (2.75 inch). The meat should be fresh and then kept constantly soaked in a brine (in the proportion of 1 part salt to 3 parts water.)

The boxes containing the meat should be hermetically sealed, otherwise the air would spoil the contents. White salt only should be used.

Salt meat, kept in store, can be there preserved for at least a year without going bad.

(5) *Rice.*

The rice must be of the last harvest, firm, free from all dust and husks. The grains should be full-sized and as nearly as possible the same in shape. The rice should be fit to keep in a store without changing for one year from the date of its reception. If a portion of it is reduced to flour, before its issue to the army, it must be sifted.

(6) *Salt.*

This must be of good quality, firm and pure. On being dissolved in water it should not leave any kind of sediment. Both rock and sea salt can be used if they possess the above noted qualities.

(7) *Sugar.*

That used should be refined, of the best sort, firm and without any taint. For issue it should be taken in in whole loaves. Pieces, however, $\frac{1}{10}$ th of the usual size can be accepted, but those below 25 grammes ($\frac{1}{4}$ ths. oz.) in weight should be rejected.

(8) *Coffee.*

This should be of the best quality (*rio-vert*) without any bad smell, taste or other defect. All the berries should have been equally roasted, their colour should be bright chestnut (*marron clair*). In order that its aroma should not be lost, coffee should not be roasted more than 8 days before its use.

(9) *Wine.*

This should be of a good quality, that known under the name of "Vin de Campagne." The so called "Vin de Chaudière," should not be taken. When it is received, wine should possess the following properties. It must be perfectly clear, of natural properties, and free from every adulteration* which is used to give strength and colour to wine. In a word, it should be genuine, perfectly pure, of sufficient strength, and fit to be kept in the military stores for one year without going bad.

(10) *Vodka*, or brandy or whiskey.

This should be prepared from the grape or the dregs of the grape, and by no means from rye or potatoes. The amount of alcohol therein should be 47% as recorded by the spirit metre of Hay-Lusak, under a temperature of 15% centigrade. Some drops of it, on being rubbed with the fingers, should give out fumes and should volatilize without leaving any traces but an aromatic odour.

Of all the above enumerated articles, in time of peace the troops only receive a ration of bread, whilst on active service they get the whole of them. The number of articles comprising the daily ration of the soldier is regulated by the War Minister, whilst the quantity of each article issued is arranged by the Intendance. As regards liquors, they are only issued by order of the Commander-in-Chief or of the War Minister. An Officer in Command of a division can, in case of need, direct their issue, but he must report having done so to the Minister of War. Articles issued to the troops must, according to the last orders, be of the following weight and size.

* Should the vines be attacked by a disease called 'oidium' (a kind of vegetable fungus) a certain quantity of lime will be traceable in the wine, viz : about 4 grammes ($\frac{1}{4}$ ths. oz.) per litre (1.7 pint.) A special instrument, called the *hypsomètre* serves to determine the amount of lime present.

Bread ration.			Articles served		out on service.		Grammes. Pounds or oz.		Liquors. Litres. Pints.	
Bread portion	750	1½	Rice	30	1/16	th lbs.	Wine	0·25	1/44	th
			Dried vegetables	60	1/8	th, lb				
Biscuits	550	1½	Salt	21	3/4	th, oz.	Beer	0·50	1/22	nd
			Fresh Beef	250	9	oz.	Cider	0·50	1/22	nd
							Vodka	0·0625		
Bread for soup	250	1/4	Salt meat	250	9	oz.	Do. issued			
(Purchased)			Salted hog's				in summer for			
			lard	200	7	oz.	mixing in water,			
Biscuits for soup	185	3/4	Sugar	21	1/8	th, lb	(ration hygienique.)			
(Purchased)			Coffee	16	3/4	th, oz.		0·03125.		

Money for soup is not issued to the French soldier separate but is deducted from his pay according to the quantity of articles forming his ration allowance. His pay is thus divided into two parts. One constitutes his soup money, which is kept by the Company Commander, the other his pocket-money. The issue of the latter takes place every six days. The amount of pay, including soup money for the several ranks of the French Army, has been thus laid down.

RANKS.		Daily pay* and pocket money.			
		With the various articles as on active service.	In quarters with one loaf.	On the march with bread ration.	Addition for troops serving in Paris.
		Francs.			
Sergeant Majors	{ 1st Class†	1·13	1·28	1·53	0·240
	{ 2nd "	1·08	1·23	1·48	0·220
Senior Non-Commissioned Officers	{ 1st Class	0·80	0·95	1·15	0·188
	{ 2nd "	0·70	0·85	1·05	0·148
Corporals	{ 1st Class	0·46	0·61	0·71	0·150
	{ 2nd "	0·41	0·56	0·66	0·125
Soldiers	{ 1st Class	0·30	0·45	0·55	0·075
	{ 2nd "	0·25	0·40	0·50	0·50
Sergeant Majors	{ 2nd Class	1·08	1·23	1·48	This is only issued to these ranks on the march whilst in France.
	{ 1st "	1·98	2·13	2·98	
Non-Commissioned Officers	{ 2nd Class	0·70	0·85	1·05	
	{ 1st "	1·08	1·23	1·48	
Corporals	{ 2nd Class	0·41	0·56	0·66	
	{ 1st "	0·60	0·75	0·95	
Soldiers	{ 1st Class	0·36	0·51	0·61	
	{ 2nd "	0·31	0·46	0·56	

* In Algeria, in lieu of an allowance of meat and vegetables, each man gets additional pay amounting to 15 centimes (1½d.) daily. Author.

† In the first class are included the best non-commissioned officers, who have served not less than six months. These wear on the arm a stripe of red tape. The corporals wear two such stripes. A non-commissioned officer one stripe of lace and a sergeant major two stripes of lace. Author.

In *Turco* Regiments.

RANK.					DAILY PAY.
Sergeant Majors	...	...	...	...	1·25 francs
Corporals	...	...	...	...	1·10 "
Clarion players	...	...	...	...	0·60 centimes
Riflemen	{ 1st Class	...	...	...	0·60 "
	{ 2nd "	...	...	...	0·50 "

As I have said above, in these figures is included the soup money. Their importance lies in the following:—

(1) With the bread allowance granted by the State the troops need buy nothing.

(2) The formation of a ration reserve out of which expenditure can be incurred in providing luxuries for festivals, for special occasions, or during a period when things are dear. This capital for each man cannot exceed—

In France	{ For the infantry 0·70 centimes	} per diem.
	" " cavalry 0·80 "	
In Algeria	{ " " infantry 1·50 "	
	" " cavalry 1·75 "	

The proportions of this modest sum can be increased by order of the Commander of an Army Corps, provided the meat ration does not exceed 300 grammes (10½ oz.) and the bread, purchased for the soup, 250 grammes (9 oz.).

The income derived from the soup money is made up of normal and occasional contributions: to the former relate—

Deductions from the daily pay of each man:—

When in quarters and in receipt of a bread ration	0·41 centimes.
" on the march ditto ditto ditto.	0·51 "
" on service and in receipt of full rations	0·18 "

The private occasional receipts comprise:—

(a) Deductions amounting to 15 centimes (1½d.) from each soldier who is allowed to perform voluntary work.

(b) Deductions from officers under arrest (except when confined to quarters) viz. 5th part of their daily pay. This is thrown into the soup money fund.

(c) The supplementary allowance of five centimes (½d.) from non-commissioned officers who mess together.

(d) The whole of the pocket money of those non-commissioned officers and privates who are under arrest, in prisons or confined in cells.

(e) The whole of the pocket money of individuals who are absent without valid excuse during the issue of this money. (The issue takes place every six days.)

(f) Half of the daily earnings of the disciplinary companies.

(g) The money realised by the sale of bones, fat, and cinders left after the food is prepared.

The expenditure from the soup money fund is confined to the purchase of beef, bread for soup, and all the spices in the food.

Under this head the following small items are classed: (a) purchase of the victualling account books in the possession of each soldier, (b) lighting of the barracks, (c) purchase of brooms, grease for marking the uniform, under linen and boots, &c. &c., (d) payment for shaving each man per month *viz*: 10 centimes (1d.) per man (his hair is cut *gratis*) (e) washing the soldiers' under clothing, (f) purchase of lard and powder for cleaning and oiling the rifles, &c. &c., (g) purchase and keeping up of baskets for the meat, (h) maintenance of the kitchen utensils, (i) maintenance of baskets for charcoal, &c. &c.

Fuel in peace time is served out to the troops both in France and in Algeria as an item of rations.

The supply of fuel is in the hands of the Intendance Department, which is obliged to give a contract for it. In the chief town of every territorial division there is a committee whose duty it is to look after the regular supply of fuel to the troops. This committee consists of the following persons—the divisional Intendance Officer, with the rank of president, one of the members of the Municipal Council (appointed by the Mayor), the Assistant Commissariat Officer, who has immediate charge of the wood supply, the chief of the divisional staff, and one of the members of the Chamber of Commerce.

In war time, and in many of the expeditions in Algeria, the wood allowance has been included amongst the necessities of life and its issue entrusted to officers attached to the Intendance Department. The troops have there been supplied with it, either by purchase in the market, by requisition on the people of the country, or by cutting down forests, a work undertaken by the troops themselves.

Fuel is issued to the troops partly in wood, partly in coal. In Algeria the law prohibits the use of fig, olive, orange and mulberry trees as fuel.

The quantity of fuel allowed for the preparation of soldier's food is as follows:—

		Wood		Coal	
		Kilos.	lbs.	Kilos.	lbs.
To non-commd. officers, using an economical stove, per man per day		1·60	3·20	0·80	1·10
Average allowance to troops who prepare their food in stoves on an economic principle.	(1) For each stove of the old pattern, with one Kettle, daily allowance	25	50	14	30
	(2) For each stove of the old pattern, with two Kettles, daily allowance	42	90	24	50
	(3) For each stove on Shoomar's system, with two Kettles, daily allowance.	40	86	22	48

Daily allowance of every private in barracks, but who has not a stove on the economic principle, both in France and in Algeria	0.80	1.60	0.40	0.80
In Algeria, to small detachments at distant points	0.85	1.70	0.43	90
Daily allowance of every soldier billeted on the inhabitants	1	2.00	0.50	1.00
Daily allowance to troops in camp	1.20	2.40	0.60	1.20

Before explaining the organisation by means of which the Army is supplied, we will first say a few words regarding the share of the Intendance Department in the victualling of the troops. This share is very large and comprises three main operations, *bread*, *wood* and *meat*. In the first, the Intendance Department buys the grain, grinds it in the state mills, makes the bread and serves it out to the troops, prepares biscuits and keeps them in store until they are issued. In making over to the Intendance Department the whole of the bread supply, the Government reckons on the attainment of but one object, the securing to the troops bread of good quality (without adulteration and well baked), and this object is pursued in spite of the fact that the bread supplied by the Intendance is not so cheap as that furnished by private bakeries. The figures quoted below, which I received from the Algerian Intendance Department, show how much the Commissariat Department has to pay for a ration of bread amounting to 750 grammes (27. oz.), and for a ration of biscuits equal to 550 grammes (20 oz.). With the price of wheat at what it was in Algeria in 1874-75, 100 Kilos (210lbs) *le quintal métrique* in the ear cost 26½ francs (£1, 1s, 3d.) The cost of grinding this quantity was as follows:—

			F.	C.	£.	s.	d.
Cost of grinding	...	...	1.	68	0.	1.	5.
" "	...	...	0.	50	0.	0.	5.
TOTAL	...		2.	18	0.	1.	10.

Deduct from this 1 franc 37 centimes (0. 1. 2d.), the sum realised by the sale of 12 Kilos (24 lbs.) of straw after winnowing. Thus 100 Kilos (210lbs.) of corn gave 88 Kilos (180lbs.) of flour at a cost of 27 francs 31 cent. (£1. 2. 0), or 100 Kilos (210lbs.) of flour cost 31 fr. 4 cent. (£1. 5. 0.)

100 Kilos (210lbs.) of flour, on being converted into bread, produce 200 rations, of 750 grammes (27 oz.) each, so that the cost of each ration amounts to 15, 52 cent. Add to each ration for salt, yeast, fuel

and labour* 1 cent. and we find that the cost of one bread ration of 750 grammes (27. oz.) comes to 16, 52 centimes.

Similarly 100 Kilos (210lbs.) of flour produce 96 Kilos (200lbs.) of biscuits. The cost of one biscuit ration of 550 grammes (20. oz.) will be as follows:—

100 Kilos (210lbs.) of biscuits (or 181 rations)	<i>F.</i>	<i>C.</i>
will cost (for flour alone)	32	33
Add for fuel and labour	2	55

Total cost of 181 biscuit rations	...	34	88
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or for one	...	19.	24
		centimes.	

In this account no mention is made of the cost of maintaining the mills, ovens and the expenses on account of the large personal establishment engaged in the manufacture of the above rations; with these additional charges, a bread ration of 750 grammes (27. oz.) would cost approximately (having regard to the extent of the work done) from 20 to 25 centimes, whilst in private bakeries 750 grammes (27. oz.) of good wheaten bread would cost 21 centimes†.

Regarding the second operation, the *wood* supply, we have already said a few words above. The part taken by the Intendance Department in this is confined to letting out contracts for it and to appointing special committees to see that these contracts are duly carried out.

The third operation, the meat supply, has been only recently placed in the hands of the Intendance Department. By the order of the 20th February 1873, an important reform has taken place in the providing the troops with meat. In order to secure to each soldier a daily allowance of 300 grammes (10½ oz.) of meat of good quality, the French Government has made over this portion of the victualling of the troops to the Intendance Department, which now, through the agency of contractors, furnishes all the troops daily with a meat ration on the above scale. (In Algeria this contract system has come into operation only since the 1st January 1875, so that the details given below regarding the food of the troops in that country, and the purchase of meat by them, have been modified accordingly). For the payment of the contractors, the Intendance Department deducts from the soldier's pay (which includes the soup money), 26 centimes (2½d.) per diem, and then, should it not be possible to purchase 300 grammes (10½ oz.) of meat for that sum, it supplies the difference out of a fund specially allotted for the purpose. This difference is often very considerable. Thus in the town of Algiers, where products are relatively very cheap,

* The labour is here reckoned only at the additional rate allowed to the workmen according to the number of loaves that they prepare, and does not include the pay which they also receive. Author.

† In Algeria, during a campaign, the Commissariat can only supply the biscuit ration. The supply of fresh bread is made over, generally on contract, to private individuals. Author.

300 grammes ($10\frac{1}{2}$ oz.) of meat cost 36 centimes ($3\frac{1}{2}$ d.)* *i. e.*, the Commissariat Department, on receiving from each soldier 26 centimes ($2\frac{1}{2}$ d.), adds ten centimes (1d.), an addition which in the year amounts to 36 francs or £1-9-0, per man. In France the difference is even still more considerable. Thus in Lyons, 300 grammes ($10\frac{1}{2}$ oz.) of meat cost 43 centimes (4d.)†, entailing a daily addition for each soldier of 17 centimes ($1\frac{1}{5}$ d.), and a yearly addition of 61 francs (£2-9-0) per man. In Paris the prices must be still higher. The average yearly additional cost for the whole Army may, it is supposed, be from 8 to 10,000,000 francs (from £320,000 to £400,000). How far the supply of meat to the troops by contract may be practical, further trials will alone show. But even now the question is deserving of serious attention looking to the fact that the French Government has recognised the necessity of supplying every soldier daily with 300 grammes ($11\frac{1}{2}$ oz.) of good meat, and in order to make sure of this supply considers it well not to be hindered by any kind of pecuniary considerations, notwithstanding the extreme dimensions of its last war budget.

Before finishing our mention of the part performed by the Intendance Department in victualling the army, we should add that to it too is entrusted the preparation, preservation and issue to the troops of spirituous liquors, coffee, sugar, salt meat, rice, &c. &c.,

Let us now turn to the arrangements for the victualling of the army by the troops themselves.

The purchase, receipt and distribution of the various articles to every regiment are entrusted to a special committee which is appointed by the Commandant of each regiment.‡ This committee consists of a battalion Commander, with the rank of president, four Captains or Company Commanders, one Sub-lieutenant or Lieutenant, as Secretary, to superintend the correspondence and accounts and with a voice as adviser only. At the meetings of the Committee two non-commissioned officers attend who are likewise nominated by the Commandant of the regiment. Both the Secretary and the non-commissioned officers are relieved of their regimental duties. The Battalion and Company Commanders take it in turn to compose the committee which, by this arrangement, is renewed three times a year, viz: on the 1st February, 1st June and 1st October.

The committee opens its proceedings on the initiative of the president, or, in his absence, of the Senior Officer.

The committee addresses itself directly to the Intendance Department and to the civil authorities on all questions tending to facilitate economical operations. Should it not find itself in a position to get the better of the combinations of traders and suppliers, it turns for aid to the municipal officials, the sub-prefects and prefects.

In principle, the Committee only concludes contracts with the trade for the supply of articles either in the public market or by private

* In 1875 the Algerian Commissariat Department paid to the trade for meat at the rate of 1fr.20 cent. (1s.) per Kilo. Author.

† The "Akbar" newspaper, 22nd December 1874. Author.

‡ *Journal Militaire Officiel*, 1872. Tome neuvième. P. 395. Author.

arrangement. However, if any economy can be effected by so doing, the committee can conclude small or wholesale purchases directly with the producers. In case the troops refuse to accept the provisions tendered to them by the contractor, the committee finally settles the question as to their fitness or unfitness, and has the right, if necessary, of changing inferior provisions by others purchased at the expense of the supplier.

The receipt of provisions falls under two heads: (1) all articles tendered for directly by the contractor are made over to the company, (2) that portion which is placed in store is afterwards served out by the committee itself. Every five days the contractors are paid up. The Secretary receives the money from the regimental chest and gives receipts in return under the orders of the Committee.

Purchase in the market, or direct from the supplier, is met from sums in the hands of company commanders. The Secretary of the committee prepares, on the 1st of every month, an account of all the operations of the committee. The totals of this account are made up every week, and the account is presented to the commandant of the regiment.

Concluding this exposition of the theoretical arrangement that obtains at once both in France and Algeria, we will now pass to an examination of the food supply of the Algerian Army only, and we will begin with what is served out to the troops in quarters.

In quarters every soldier in Algeria receives from the Intendance daily a ration comprising the following articles:—

				Grammes	Oz.
Bread	...	...	...	750	27
Coffee	...	...	...	16	$\frac{1}{2}$
Sugar	...	...	...	21	$\frac{3}{4}$ ths.

Every fourth day, (sometimes less frequently), instead of 750 grammes (27 oz.) of bread he gets 550 grammes (20 oz.) of biscuits, and in place of the coffee and sugar, $\frac{1}{4}$ litre (.44 pt.) of red wine. Besides this the Intendance Department furnishes the soldier with fuel for the cooking of his food. Meat, vegetables, spices and bread for his soup, must be purchased out of the soup money.* The amount of this money depends on the branch of the service, and in the infantry, even the line regiments, Zouaves and Turcos each receive different rates. The average rate may, however, be reckoned at from 55 to 70 centimes (5½d. to 7d.) per diem, so that the soup money amounts to from 45 to 52 centimes (4½d. to 5d.) a day. In the Zouave regiments the following are the rates of pay and the deductions made therefrom.

	PAY.	DEDUCTIONS.
Privates of the 1st Class ...	66 cent. (6½d.)	48 (5d.)
„ „ „ 2nd „ ...	61 „ (6d.)	48 (5d.)

* This article was written by me in Algeria in 1874, when the meat supply of the troops had not been placed in the hands of the Commissariat Department. Author.

For the 48 centimes (5d.) deducted from each man, rations in the following proportions* are allowed.

	Grammes	Oz.
Beef	300	10½
Bread for soup	250	8½
Dried vegetables (such as cabbage, potatoes)	600	21
Or fresh vegetables of the kinds enumerated	400	14

Salt from 16 to 20 grammes ($\frac{5}{8}$ ths. to $\frac{3}{4}$ ths. oz.) per man.

The purchase of these articles, and the receipt of the authorised rations from the Intendance, comprise the duties of a special committee. In Algeria such committees are generally battalion and not regimental, for complete regiments are scarcely ever quartered in one place. The battalion committee consists of two Captains, two Lieutenants, one Sub-lieutenant, as Secretary, and two non-commissioned officers who attend its meetings. The members of the committee are appointed in turns from the whole battalion and are on duty for a week at a time. For the supervision of the issue of rations a representative is appointed from each company. This man is selected by the company Commander from among the Corporals. He must receive, take charge of and account for the rations which he has made over to him by the committee. He must then serve them out to the company-cook and look after the preparation of the soldier's food. The representative has scarcely ever occasion to conduct the purchase or to make payments on the same account.

As we have said above, the articles received by the troops as rations consist of bread, coffee, sugar, and firewood for the preparation of their food. All these things are collected by the Intendance Department and made over to the committee. Bread is served out every second day when one loaf of 1500 grammes (3½lbs.) is allowed to each man. The member of the victualling committee, who is on duty, weighs every 28th. loaf and anything over and above the 750 grammes (27 oz.) which is allowed daily for every man, goes to the use of the troops, and any shortness of weight is made up by spare loaves, the number of which for a company of 80 men amounts to five. These loaves are distributed amongst the half companies, and those men who assert that they have received rations of short weight get some of the surplus pieces. The bread furnished by the Intendance Department is very good and well baked, though it does not swell properly in soup as does that furnished from private bakeries.

Contracts for the whole battalion are let out by the committee separately, (1) for meat, (2) for bread for the soup, (3) for vegetables,† and sometimes (4) for salt and pepper. Contracts are given twice a

* The amount of meat and bread for soup bought for each soldier is somewhat changed according to the condition of the victualling fund and the market prices. The figures given above may be considered to represent the *maximum*. Author.

† In Algeria, as in France, the troops prefer to have their vegetables bought rather than look after their own gardens. Author.

year and on more favourable terms in proportion to the good faith and scrupulousness with which they are carried out. Every five days payment is made for the articles supplied, so that the money for five days supply is in the hands of the committee as a deposit, which they can use for the purchase of other articles should those furnished not be satisfactory. Excepting in winter-time, articles furnished by contract are brought twice daily. In winter they are furnished every evening for the whole of the following day. The articles are either taken by the contractor direct to the battalion where they are received and divided amongst the companies by the member of the committee who happens to be on duty, or, oftener, from each company several men, under the representative, are appointed, and there, in the presence of the aforesaid member of the committee, take the meat, bread and other rations from the contractor's shops.

The daily meals both of French soldiers in Algeria, and also of the Turcos who are recruited from amongst the natives, consist of coffee, breakfast and dinner. In summer coffee is made at 4-30 A.M., breakfast takes place at 9. A.M., and dinner at 5. P.M. In winter the hours for these meals are respectively 7. A.M., 9. A.M., and 6 P.M.

Five days a week, both at breakfast and dinner, soup is given, and twice a week for breakfast, instead of soup, *ragout* is supplied, about which we will speak below. For the preparation of the food, one soldier per company is appointed as cook (usually for this duty soldiers are selected who have already had some experience in the culinary line). Although, according to regulation, the cook must be changed monthly,* in practice, in the majority of cases, he remains unchanged. In turn, one of the private soldiers is appointed daily to assist the cook.

The company cook has nothing deducted from his pay on account of his rations. This is equal to giving him monthly 14 francs and 40 centimes (about 12-2d.)

In barracks there is one cook house for each battalion. The stoves and kettles are of different patterns, but the latest and most practical is considered to be that on the Shoomar system. In this pattern stove (which is of small dimensions) are fixed two kettles, one of which is in the form of a cone with the top cut off. The principle in view in the use of this kind of stove is to economise fuel.

In each of the two kettles soup for 65 men can be prepared. In the present numerically very weak condition of the French Army in Algeria, the number of privates per Company not exceeding on the average 50 men, each stove on the Shoomar system with two kettles serves for two companies. For a stove with two boilers the Intendance Department allows daily 80 Kilos (160lbs.) of fire-wood.

The preparation of the soup for the breakfast begins in winter at 3 A. M.

The representative gives out to the company cook half the quantity of meat, vegetables, bread and salt for the soup, which he has received the evening before for the whole day. This should, on an

* Journal Militaire, 14 Mai 1870, Page 203. Author.

average, consist of 150 grammes ($5\frac{1}{4}$ oz.) of meat, 300 grammes ($10\frac{1}{2}$ oz.) of vegetables, 125 grammes ($4\frac{1}{2}$ oz.) of bread for soup, and from 8 to 10 grammes ($\frac{1}{4}$ to $\frac{3}{8}$ ths oz.) of salt per man.

By 8 $\frac{1}{2}$ A. M. the soup must be ready. The cook cuts up the meat, and divides it into portions according to the number of those who are to partake of the contents of the kettle. This operation takes $\frac{1}{2}$ hour. Meanwhile, on a table in front of the stove, are already placed in order the iron kettles of each man. Into each of these is first of all placed the bread for the soup (125 grammes ($4\frac{1}{2}$ oz.) per man), then the portions of meat and vegetables. The gravy left in the cauldron is then mixed with water and boiled, and is then distributed amongst all the kettles which are covered up so as to allow the contents to be thoroughly soaked. The soup made is strong and savoury, but is insufficient in quantity, and would not, for example, satisfy the stomach of a Russian soldier. The soldiers, on receiving their respective canteens, breakfast in the barracks. As many of them as we chanced to see, divided their soup into two portions, one of which comprised the liquid portion, cabbages, carrots, beans and boiled bread, the other the bits of meat and some potatoes.

Soup is the principal food of the French soldier. In this the kinds of vegetables are occasionally changed. Thus, the cabbages, carrots and potatoes sometimes give place to white beans. Twice a week for breakfast, in place of soup, *ragout* is prepared. This is a great favourite of the soldiers, but it is somewhat more expensive. For the *ragout* each soldier is allowed.

					Grammes	Oz.
Mutton	...	...	...	...	125	$4\frac{1}{2}$
Macaroni	...	...	...	...	100	$3\frac{1}{2}$
Potatoes	...	...	...	...	600	21
Lard	...	...	...	...	30	$1\frac{1}{4}$
Pepper	...	...	...	...	2	$\frac{1}{10}$ th
Salt	...	...	...	...	8	$\frac{1}{4}$

First of all a thick soup is separately prepared of potatoes and macaroni, and then into this is placed pieces of mutton cooked in the lard and seasoned with pepper and salt.

Should the money allowance be insufficient, the *ragout* is prepared without meat.

In the evening for dinner the soldiers get a soup of the same quantity and quality as that allowed for their breakfast. During the whole week they receive soup 12 times and *ragout* twice.

The early morning coffee is served out in large cups, and these are accompanied with an allowance of bread.

Notwithstanding that the larger percentage of soldiers are Catholics who should observe, throughout the year, the several special fast-days on Thursdays and Fridays, *they only do so on one day in the year, viz. Good Friday.*

The non-commissioned officers of each battalion breakfast and dine together. Their food is served apart from that of the soldiers, a separate room and a separate cook-house being provided for them. Should there be a *vivandiere* present with the battalion she prepares the food of the non-commissioned officers, otherwise one of the soldiers acts as cook, and one of the non-commissioned officers as *representative*. Each non-commissioned officer has to pay 60 centimes (6d.) a day for his food without wine, and 80 centimes (8d.) with wine. The representative enters in a small book the articles received from the Contractor and pays for them every six days. The meat thus received for every non-commissioned officer amounts per diem to 400 grammes (14 oz.) and the wine to 15 to 20 litres (26 to 35 pts.) per man per month.* For his breakfast, each non-commissioned officer receives a piece of cooked meat, and a dish of vegetables, either beans or potatoes. For dinner, soup, a dish of meat, vegetables and sometimes desert. For breakfast and dinner he can have wine. The charge of 80 centimes (8 d.) per diem for their food is a very heavy charge on the non-commissioned officers and out of proportion to the pay which they receive, but they prefer to expend a considerable portion of their pocket money in order to have proper food with a sufficient quantity of wine. A non-commissioned officer who does not settle his accounts regularly receives his rations from the Company kettles until he has paid the sum outstanding against him.

Wherever it is possible, the Sergeant Major of the Companies and the Adjutant† have a table in a separate room away from that of the non-commissioned officers. They pay for their food one franc (10 d.) per diem.

We will now look into the receipts and expenditure in connection with the rationing of the Army. The principal portion of the former consists of soup money. Taking the strength of the Company to be 50 men, and the sum received from each per diem to be 48 centimes (5 d.), the monthly receipts will amount to 720 francs (about £29).

Indirect receipts from Officers and Soldiers in arrest, money derived from grants for voluntary labour, money realised by the sale of fat, cinders, bones, &c., &c., would yield on an average 25 francs (£ 1) per mensem. The total receipts would thus be 755 francs (about £ 30) a month.

<i>Expenditure.</i>	<i>F.</i>	<i>C.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
<i>Beef</i> , 300 grammes (10½ oz.) for 50 men per diem = 450 kilos (945 lbs.) @ 1 franc and 17 centimes (1 s.)= ...	516	50	20	14	0
<i>Bread for Soup</i> , 250 grammes (9 oz.) for 50 men per diem = 375 kilos (780 lbs.) @ 28 centimes (3d.)= ...	105	00	4	4	0

* In the Zonave regiments, in Algeria. Author.

† In each battalion the best of the non-commissioned officers is appointed Adjutant. His duties comprise the supervision of the whole battalion, the instruction of the Corporals, &c. The post of Adjutant is superior to that of Sergeant Major and the holder is considered to be the first candidate in the battalion for promotion to the rank of officer. Author.

	<i>F.</i>	<i>C.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
<i>Vegetables</i> , 600 grammes (21 oz.) for 50 men per diem = 900 kilos (1890lbs.) @ 7 centimes (1d.) = ...	81	00	3	5	0
<i>Salt</i> , 18 grammes ($\frac{5}{8}$ ths oz.) for 50 men per diem = 27 Kilos (55lbs.) @ 50 centimes (1d.) = ...	2	70	0	2	3
30 <i>Litres</i> (52 pts.) of petroleum for lighting the barracks @ 50 centimes (5d.) per <i>litre</i> ($1\frac{3}{4}$ pts.) = ...	15	0	0	12	6
Purchase of brooms, stamps for marking the soldier's uniform, payments to washermen = ...	20	0	0	16	6
For shaving 50 men @ 10 centimes (1d.) each month = ...	5	0	0	4	2
Total monthly ...	745	20	29	18	5

If the market prices for provisions are dearer than the foregoing (and this is so in Algeria), in order to balance the receipts and expenditure, the allowance of bread for soup is reduced from 250 to 200 grammes (9 oz. to 7 oz.) per man, and the meat ration is similarly reduced from 300 to 250, and even 200 grammes (11 oz. to 9 oz. or 7 oz.). Lastly the *ragout*, which is allowed twice a week, contains no meat at all.

The steady rise in the prices of the various articles has caused the deductions under the head of soup money to be increased from time to time. In Algeria the special increase has amounted to 15 centimes ($1\frac{1}{2}$ d.) per man daily. The 48 centimes (5d.) per man which, as we have seen, is at present sufficient in the town of Algiers, does not suffice in the town of Laghouat, in the Sahara, where for this sum they can only allow the soldier from 210 to 220 grammes (7 to 8 oz.) of meat per diem.

Let us now determine the total cost of the rations of the French soldier by adding to the above figures the value of the articles which he receives free, *viz.*, bread, coffee, sugar, wine and fire-wood.

	<i>F.</i>	<i>C.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
(1) Monthly cost of the articles above enumerated for a Company of 50 men = ...	745	20	29	18	5
(2) <i>Bread</i> , Intendance allowance of 750 grammes (27 oz.), per man per diem for 50 men, amounts monthly to 1,125 Kilos (23·62lbs.), this @ 22 centimes (2d.) per Kilo = ...	247	50	10	0	0

	<i>F.</i>	<i>C.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
(3) <i>Coffee</i> , Commissariat allowance of 16 grammes ($\frac{5}{8}$ ths oz.) per man per diem for 50 men amounts for 23 days* to 18 Kilos (36lbs.) This @ 3 francs (2-6d.) per Kilo=...	54	00	2	3	6
(4) <i>Sugar</i> , Commissariat allowance of 21 grammes ($\frac{3}{4}$ oz.) per day per man for 50 men amounts for 23 days to 24 Kilos (50lbs.) This @ 1 franc 30 centimes (1-1d.) per Kilo=	31	20	1	5	0
(5) <i>Wine</i> , Commissariat allowance of $\frac{1}{4}$ litre (7-16ths pt.) per man per diem for 50 men amounts for 7 days to 88 litres (154 pts.) This @ 40 centimes (4d.) per litre=...	35	20	1	10	0
(6) <i>Fire-wood</i> , Commissariat allowance of 40 Kilos (80lbs.) per kettle per diem amounts to 1200 Kilos (2520lbs.) This @ 4 francs (3s. 4d.) per 100 Kilos (210lbs.)=...	48	00	2	0	0
Total monthly for 50 men ...	1,161	10†	46	16	10
Total „ per man ...	23	22	2	19	$\frac{1}{3}$ rd
Total yearly „ „ ...	278	66	11	3	0

It cannot but be acknowledged that the French Government is very liberal in its expenditure as regards the victualling of the Army, and, as we have seen above, it has not yet discontinued this expenditure, for, by increasing the meat ration to 300 grammes ($10\frac{1}{2}$ oz.), and by placing the meat supply in the hands of the Commissariat, the charges under the head of rations will be still further added to. In like manner, the expenses of feeding the troops, both in peace time and during a campaign, will be more considerable because of the large number of articles allowed to the soldier.

On a campaign the French soldier in Algeria is allowed daily the following articles:—

Bread, 750 grammes (27 oz.) or biscuits, 550 grammes (20 oz.)
 Meat, from 300 to 350 grammes ($10\frac{1}{2}$ to $12\frac{1}{2}$ oz.)
 Rice, 60 grammes ($2\frac{1}{4}$ oz.) or instead of rice, dried vegetables.
 Salt, 16 grammes ($\frac{5}{8}$ ths oz.)
 Coffee, 16 „ ($\frac{3}{8}$ ths oz.)
 Sugar, 21 „ ($\frac{3}{4}$ ths oz.)

* Every fourth day, instead of coffee and sugar, each man is allowed $\frac{1}{4}$ litre (7-16th of a pt.) wine. Author.

† These figures relate only to Algeria, and with regard to the Army in France are only approximate. Neither do they include the cost and maintenance of the various appliances of the Intendance Department, such as mills, stoves, &c., &c. Neither is the food of the non-commissioned officers, which is somewhat dearer, taken into account. The army in France receives rations on a somewhat lower scale than do the troops serving in Algeria. Author.

Instead of meat, 250 grammes (9 oz.) of salt meat, or from 150 to 160 grammes ($5\frac{1}{4}$ oz. to $5\frac{1}{2}$ oz.) of lard are sometimes allowed.

The issue of wine, to the extent of $\frac{1}{4}$ litre (2-16ths. pt.) per man per diem is permitted under the orders of the divisional Commander. Besides this, in summer time, 3-100ths litre of brandy for mixing with water, is allowed to each man daily.

If the movement is taking place in peace time, the contractors prepare the bread and meat at each of the next halting places. In war time, flocks of sheep are driven with the troops, and instead of bread, biscuits are principally used.

On the march the troops get hot meat only once a day, at the halting ground. In the morning, and at the principal halt, coffee is served out. It is also given in the evening after dinner. It is intended that half the meat allowance, *viz.* 150 grammes ($5\frac{1}{4}$ oz.), should be cooked of an evening and kept in a cold state until the principal halt of the following day, but, in practice, this excellent rule is not strictly observed, for the greater number of the men eat their meat rations in the evening or the next morning, and then, at the halt, there only remains the bread to eat with the coffee, since the proportion of those men who have kept their meat is small.

Food on the march is not prepared in one large cauldron but in 8 small kettles, and these the men take it in turn to carry. In like manner they carry the other belongings of the marching cooking apparatus of each section (a tin bucket for water and a deep tin cup). Under the present composition of Companies in Algeria, each section consists of from 6 to 8 men, so that the carrying of the kettles and utensils, in addition to the weight of the loaded knapsack and the *tente d'abri*, is very burdensome.

The principal advantage derived from the preparation of food by sections lies in the saving of time as compared with the Company system of cooking.

On arriving at the encamping ground, all the men of a section take part in the cooking of their dinners. One prepares the ground, another goes in search of fire-wood, a third brings the water, a fourth goes to get the meat, and so on. The man who dawdles is hurried on by his comrades. The meat for the whole company is cut up, according to the number of the sections, into 8 pieces, in front of every one, and in order that there may be no disputing as to who shall be the first to choose the pieces, the selection is settled by casting lots. One of the soldiers is blind-folded and he distributes the pieces to the sections.

The food prepared in the sectional kettles is more savoury than that cooked in the individual canteens, but it cannot compare in flavour with that cooked in the company or the squad kettles (*i. e.*, if the company be at its full strength). On the other hand, if the preparation of the food in the separate canteens of each individual soldier is of less flavour it demands also less time.

Thus the system adopted by the French, that of preparing the food in *sectional* kettles, yields to the company system in quality

of flavour and to the individual system in rapidity of preparation. Moreover, under the system in vogue, the soldiers are more heavily weighted. The French themselves are dissatisfied with the system which they have adopted, and of late have been carrying out extensive experiments in various ways, and are inclined to go to the other extreme, for with the adoption of the individual system only—it should be borne in mind that the French have no mess system of transport—they deprive their soldiers of the possibility of getting on the march a regular supply of savoury food. It may be supposed, then, that the true settlement of this question lies in the possession, for the march, of company as well as sectional kettles, for whilst in peace time the food has principally to be prepared in the former, in war time, by force of circumstances, the latter come more generally into use. The system then at present practiced in France of having *sectional* kettles, cups, &c., burdens the soldiers and does not give them savoury food and may, in fact, be pronounced as unsatisfactory.

As an example of the victualling of Algerian soldiers on the march, I will describe the progress of two companies of an African battalion,* which I met in the Lesser Sahara, between the caravan-serais of "Rocher-de-Sel" and "Guelf-el-Stel." The distance between these points is 40 versts (26 $\frac{2}{3}$ rds. miles), and in that extent there is no water. Notwithstanding that it was the month of November, the temperature after sun-rise became high, and, therefore, the Officer Commanding these two companies decided to finish his march as early as possible. The men were roused at 3-30 A.M., made their coffee, and by 4 o'clock were on the march, whilst it was yet moon-light, for at this season of the year day does not break until 5-30 A.M. Besides their packs and *tentes d'abri*, the soldiers carried their rations of biscuits, coffee, sugar and salt for four days. At the encamping ground each man had filled his flask (a tin can containing about 3 $\frac{1}{2}$ pints) with water for drinking purposes on the march and for making his coffee at the halting ground. Only a few of the men had kept a portion of the meat served out to them the evening before. The baggage of these two companies, relatively very strong, viz : 90 men per company, was packed on two large waggons drawn by six mules. These waggons carried 2400 kilos (5000lbs.), including the officer's baggage (each officer has the right to put into the waggon 100 kilos (210lbs.) weight of things), a portion of the soldiers' 'Kit,' such as new suits of uniform, new boots, a small supply of cabbages from the battalion garden (a rarity both in France and in Algeria), a large coop of fowls for the officers' use. The march, in places over a sandy soil, was very heavy for these springless vehicles.

Following established custom, after an hour's march, the men were halted for ten minutes. After traversing 27 versts (18 miles) a halt was made for one hour. The men now made their coffee with the water they had in their flasks and eat with it their bread. The fortunate individuals who had kept their meat, were objects of general

* The two African battalions serving in Algeria are made up of soldiers who are completing the period of their imprisonment under the orders of the Military Department.
Author.

envy, for a cup of coffee with bread or biscuits only serves to whet the appetite. By 12-30 P.M., the companies had reached their encamping ground at "Guel el Stel," having traversed the 40 versts (26 $\frac{2}{3}$ rds. miles) in 8 $\frac{1}{2}$ hours, i. e. nearly 5 versts (3 $\frac{1}{3}$ rd. miles) per hour. The contractor had already laid in a supply of meat and bread at the caravan serai. The four day's supply of biscuits, which the soldiers carried with them, were only to be consumed under exceptional circumstances, such for example, as the failure of the contractor to furnish bread. The Companies took up their quarters near the caravan serai, the officers inside it. The men of each section proceeded at once to pitch their tents and to cook their food. In half an hour's time the camp was formed and the soup cooking in the *sectional* kettles. Two of the soldiers prepared the soup for the non-commissioned officers in a separate vessel. A steppe growth, the *djel* grass (*atriplex inollis*), growing in great abundance round the caravan serai, served as fuel.

In 1874, during the manœuvres of the 7th Army Corps in France, as an experiment for the testing of *sectional* kettles, they reduced the ration of meat to 250 grammes (9 oz.) and they added thereto 40 grammes (1 $\frac{1}{2}$ oz.) of hog's lard. Of the 58 centimes (6d.) deducted from each soldier they kept 26 centimes (2 $\frac{1}{2}$ d.) for the meat and with the balance vegetables were bought. At the principal halt, each soldier having supplied himself with a little garlic, prepared in his own canteen a soup made of hog's lard, garlic, bread or biscuits. Only $\frac{1}{2}$ hour was allowed for the preparation of this mixture, whilst for the manufacture of meat soup, two hours are required. Notwithstanding its want of nourishing properties, such food is very much used in France and is a favourite not only of the soldiers but also of the officers.

The food in regiments of *Turcos* (composed of natives, principally Kabyls, inhabitants of the mountains) is the same as that of French troops both in respect of articles allowed and their preparation. It may merely be observed that the *Turcos*, in the preparation of their food, are less cleanly than are the French. With the authorised meat ration, the *Turcos* prefer to use radishes rather than carrots, hence their soup is somewhat bitter, though not without a certain flavour of its own.

The regiments of *Spahis* (recruited from Arab nomads, inhabitants of the steppe country) have no common squadron system of food supply. Each man receives 44 centimes (4 $\frac{1}{2}$ d.) and has to supply his own food. When they receive the usual rations of bread, coffee and sugar (see above, Page 170, instead of 44 centimes, each *Spahi* has only to pay 18 centimes (2d.). In quarters, the *Spahis* live with their families and prepare for themselves their own national Arab food, and on the march, instead of receiving bread or biscuits, coffee and sugar, they more frequently make use of their own provisions, purchasing a small number of sheep and preparing *Koos-Koos* of cereals (wheaten or barley flour mixed with water after having been passed through a sieve). When rapid movements have to be made without camels, the *spahis* according to their means, make up victuals of three kinds, *refaz-toowzi*, *roosh-emat*, and *rootchina*.

Into the composition of the first of these, enter dates, then flour, honey, pepper and salt. Having taken the stones out of the dates, they make of them, in combination with flour and honey, a sort of paste, which is warmed up with oil, pepper and salt being added to the mixture. The composition is then made up into the shape of sausages, each of which weighs about a pound. During the day they eat sometimes one, sometimes two of such sausages, and this constitutes the whole daily food of a *spahi*. The *refaz-toowzi* is very nutritive, agreeable to the taste, and can be kept without spoiling for about a month.

Round cakes, baked in hot ashes, of flour and dissolved in water with an egg, are called *Rooshee-matom*. These cakes become very hard in the sun and also from lapse of time. A *Spahi* will eat in the day three of such cakes.

Finally, the *rootchina* constitutes the most modest dish which is able only to satisfy to the full an unexact and healthy stomach. It is a simple coarse wheaten or barley flour mixture, slightly beaten up with a small quantity of oil. On arriving at the halting ground, the *spahi* (and indeed every nomad) prepares in hot water, balls of this flour. If he cannot get hot water, in the skirt of his own *burnous*, he will moisten a *rootchina* with cold water, and then, breaking it with his fingers, eat it twice during the day about $\frac{3}{4}$ lbs. at each meal.

In movements made with the transport train, the *Spahis*, as well as the camel drivers, make use of the flesh of any fallen camels, cutting the throats of the animals (according to Mahommedan law) just when they are about to take their last gasp. The flesh of such animals is cut up in strips, and salted for future use. Generally speaking, the food of the *Spahis* must be considered as considerably worse than that of the French soldiers or the *Turcos*. Having been with small detachments of *Turcos* and *Spahis* during a two months march in the Greater Sahara, I have observed amongst the latter class of soldiers frequent cases of sickness, especially fever. One of the causes of this fact must be the bad food of the men concerned, more so, perhaps, than the circumstance that the regions of the Greater Sahara, which we traversed, were almost foreign in climate to the *Turcos*.

Let us now say some words regarding the food of the French Officers in Algeria. The daily food of the Officers in Algeria (as in France) consists of breakfast, generally from 10 to 11, and dinner, from 6 to 7 P.M. Notwithstanding that in even the smallest towns wherein troops are quartered, Officers' messes have been established, the Officers, excepting those who are married, almost always take their meals at an hotel or a restaurant. They make an arrangement with the proprietors of such establishments according to which he sets apart for the use of the Officers rooms according to their number. The price of the meals to be provided depends on that of the articles indicated for the breakfast or the dinner, or, as the Officers call it, the monthly payment for the *pension*. In one and the same room, the Captains of a battalion will sit at a table away from that of the Lieutenants and Sub-Lieutenants, whilst the Battalion Commanders again will have a table separate from that of the Captains. Although

receiving almost the same sort of food, the Captains pay more for their *pension* than do the Lieutenants and Sub-Lieutenants. The caterers, in fixing a lower rate for the latter rank of Officers, calculate on the larger number there are of such officers. In large towns, like Algiers, Oran and Constantine, the Captains often have their *pension* in a room separate from that occupied by the Lieutenants and Sub-Lieutenants of their own battalion. Even in such small towns as Djelfa, Laghouat, &c., the Captains try to set up a separate mess, and often content themselves with the food prepared by their soldier-servants or by the soldier-cooks taken from the Companies. The older officers, if they are bachelors, either meet together at a common table d'hôte or dine apart, and though they may occupy the same room as that of the other Officers of their respective battalions, they sit at separate tables.

These divisions into groups according to ranks, I observed in many towns, but especially so in the town of Medea. The Officers of a Battalion of Zouaves and those of the 50th Battalion of the Line, quartered in this town, had their own table at the "Regence" Hotel. In the largest room of this hotel there were placed two large and two small tables. At the two former sat the Lieutenants and Sub-Lieutenants of the Zouaves and of the 50th Battalion of the Line, and at the two latter, the Captains of the same regiments. In another room at two small tables sat their Battalion Commanders.

The monthly payment for *pension* depends on the several localities in Algeria and varies from 65 to 90 francs (from £2-12-0 to £3-12-0). The Captains pay from 8 to 10 francs (6-6d. to 8-6d.) and the superior Officers from 20 to 30 francs (15-s to £1-4-0) a month more than the Lieutenants and Sub-Lieutenants.

The food taken by French Officers at breakfast and dinner is generally very fresh, plentiful and varied. The breakfast consists of two meat courses (or of one meat and one fish course), one dish of vegetables and dessert. Dinner comprises soup, two meat courses (or one meat, one game or poultry) one dish of vegetables, salad and dessert. Very often to both meals are added omelettes, sausages, artichokes, macaroni, &c. All the year round, as an appetiser, radishes and butter are on the table. The dessert is very plentiful and includes cheese, dried and fresh fruits, nuts and almonds. The fruits are either *bananas* or figs, dates, oranges, pears, grapes, &c., &c. At both breakfast and dinner there is plenty of red wine which is drunk either pure or diluted. A quantity of dishes is, in the opinion of Frenchmen, the *sine qua non* of a good dinner or breakfast. Roast beef, baked or fried potatoes and salad are regarded as three separate courses and are eaten from off separate plates. The soup, and the beef from which the soup is made, are also served separately.

The average quantity of food consumed at breakfast and dinner by French Officers is, according to my approximate calculations, as follows :—

Bread from 400 to 600 grammes (from 14 to 21 oz.)

Meat, fish, game, from 500 to 600 grammes (from 18 oz. to 21 oz.)

Vegetables, fruit, up to 600 grammes (21 oz.)

Each individual requires daily from 1 to 1½ bottles of wine. Besides breakfast and dinner, French Officers drink coffee two or three times daily, as well as a considerable quantity of spirituous liquors such as absinthe, vermouth, liqueurs, beer, &c.

Coffee, cognac and beer are drunk after breakfast and dinner, the absinthe and vermouth, mixed with water, before those meals. Some of the officers, besides wine for dinner, indulge in coffee. The taking of coffee is according to French expression "refreshment" which in the larger towns is procurable in the ordinary restaurants, and in the smaller, in the officers' messes. In the latter, the officers assemble for this "refreshment" in the same groups as for breakfast and dinner.

Breakfast, dinner and "refreshments" take up from 4 to 6 hours of a French Officer's time. The sum he spends in liquor is from 30 to 40 francs (£1-4-0 to £1-12-0) per mensem, and this, in addition to what his breakfast and dinner costs, swallows up the greater portion of his pay (especially if he be not of superior rank).

On the march Officers are satisfied with the allowance made to them of complete rations of bread, meat, coffee, sugar, &c., but, if possible, they add to such allowance by the purchase of fowls, eggs, milk, preserves, spices, wine, &c. The number of soldiers' rations allowed to each officer depends on his rank, as shewn in the following scale :—

	In Algeria.	On service
	No. of rations.	
(1) Colonel and Lieutenant-Colonel ...	3	3
(2) Commandant of a Battalion, Major ...	3	2
(3) Captain	2	2
(4) Lieutenant and Sub-Lieutenant ...	1½	1½

In peace time no allowance of rations is made.

In quarters, in place of rations, the Officers get table allowance.

Before concluding this article on the food of French troops, I will allow myself to make the following observations on the question under review :—

- (1).—The food of French soldiers answers in its chief bases to the theoretical ideal constructed by French physiologists, both as to *quality* and *quantity*. It is true that Langet, as we have seen in the beginning of this article, lays down the normal amount of food of a man to be 1,000 grammes (35 oz.) of bread, 300 grammes (10½ oz.) of meat and from 500 to 600 grammes (18 to 21 oz.) of vegetables (this scale admits of the required proportions of azotic and non-azotic particles).

- (2).—The secondary requirements of food, relating to its variety and alteration according to climate, are not taken into consideration in the question of the feeding of a French soldier, for what he does receive is too uniform (12 times a week it is exactly the same). The soup and bi-weekly *ragout* which he gets in Algeria is precisely what he receives in the north of France.
- (3).—One of the principal conditions demanded of a soldier's food: its *cheapness*, the French put in the second place, and after the conditions of *quality* and *quantity*.
- (4).—The part taken by the Intendance in the victualling of the army is large. The advantages thereby derived are (a) the relieving the soldiers of much work in the way of providing for themselves, work which would take from the effective strength of the several companies (by calling away bakers for example), (b) the securing to the troops articles of good quality, (c) the securing to them also of the fixed allowance of 300 grammes (10½ oz.) of meat. On the other hand, the centralisation of the victualling of the army in the hands of the Intendance, is faulty chiefly in its complete inapplicability (as the experiences of the late war have shewn). Soldiers who are accustomed in time of peace to see in everything they get the hand of an Intendance official, in time of war expect a continuance of the same agency and to the same extent, and consequently suffer privations which would otherwise be avoided. Therefore, a company that was in the habit of looking after its own victualling, with its own bakers and its own company rather than battalion or regimental system, would the quicker contrive means for feeding itself than a company of French soldiers that was in the habit of getting everything made ready for it. The handing over to the Intendance of the provisioning of the army has yet another weak side. Centralising in itself not only the victualling of the troops, but also of the hospital and transport establishments, it requires a vast *personale*. In order to attract to this *personale* individuals possessed of the necessary scientific and moral qualifications, the French have made service in the Intendance a privileged position as contrasted with the ranks of the army. There are frequent examples, which even include officers of the general staff and especially those holding the rank of Captain, of Officers who have entered the Intendance rapidly superseding their comrades in the ranks, and obtaining larger allowances. The experience of the late war has shewn that the French Intendance Department, notwithstanding its apparently select organization, has far from justified the hopes expected of it.
- (5).—The regimental and battalion victualling committees, in practice, often play a very secondary part in the rationing

of the troops. The members of such consider these duties to be without the circle of their direct obligations. The Secretary, who is either a Lieutenant or Sub-Lieutenant, and who in theory has no right to vote, in practice often has the deciding voice. The part taken by the silent Under Officers in the proceedings of the committees is simply a useless formality.

- (6).—The selection of the Company representative, who is nominated by the Company Commander, should be left to the rank and file themselves.
 - (7).—The cooking of the soldiers' food on the march by sections, and the carrying of it by the men in sectional kettles, &c., are impracticable operations.
 - (8).—The cup of coffee with bread at the principal halt, after the greater portion of the march is over, is insufficient. Care should at least be taken to see that the rations of cooked meat served out to the men the evening before were not consumed before the time at which it was intended they should be used. But better than all, were this meat carried for each Company; as once having been served out to each individual soldier it is beyond control.
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VI. TAKING STOCK.

*Text of a Lecture delivered by Colonel G. Chesney, R. E., in the
United Service Institution Rooms on 31st May 1882.*

THE MARQUIS OF RIPON, K. G. P. C., G. M. S. I., IN THE CHAIR.

Every person connected with the Indian Army, I might almost say every one connected with the Indian Administration, must feel interested in the prosperity of the United Service Institution. Your Excellency testifies to this feeling by doing us the honour of being present to-day. For my own part, having this feeling strongly, and understanding that the welfare of the Institution is deemed to require that a certain number of lectures should be delivered every season, I was very pleased to be offered the opportunity of contributing my humble quota to that—perhaps, somewhat dismal form of entertainment. The difficulty was to find a subject to lecture upon. I have unfortunately no personal experiences to communicate of the recent great operations in which our army has been engaged, while on such technical questions as the proper form of range-finder, or the best way of loading a mule, others are better qualified to speak. I have thought, however, that I might usefully invite your attention to a subject of which the interest can never cease. It is a subject indeed to which it is difficult to do justice within the limited time for which I shall venture to detain you—it is briefly this—the rise and fall of armies, or rather, to attempt to find an answer to the question—wherein lies the secret of the superiority exhibited, now by the army of one nation, now by that of another, as each in turn becomes the foremost of its time? The most superficial observer of military events must have been struck by the great ups and downs which military institutions undergo, and how the superiority rests now with one nation and then with another; history in fact being the record of a constant military see-saw. Not to go back to ancient times, or even to that of the famous Spanish infantry, one hundred and twenty years ago the Prussian Army was *facile princeps*, at the head of the armies of Europe. That army, under Frederic the Great, had inflicted one crushing defeat after another on the armies of Austria, France, and Russia, and, although drawn from a scanty population, and having only a weak treasury to rest upon, and unsupported, save indirectly by England, yet succeeded at the end of the seven years war in extorting an honourable peace from the great military coalition opposed to it. The reputation thus gained remained to it for many years, and the annual military manœuvres which the old Prussian King practised, were visited by the officers of all nations for improvement and instruction—a relic of the traditional superiority of Frederic the Great's army surviving

almost down to our own day in the well known children's game of German tactics.

This reputation of the Prussian Army, which clung to it for nearly half a century, was rudely and unexpectedly shattered in the campaign of 1806. From that time, until within quite recent years, the military superiority of the French was equally unquestioned. It was truly said of most of the battles fought under the first French Empire, that the continental armies were beaten before they went into action, and although eventually Napoleon was overpowered by numbers, the prestige and moral superiority of the French lasted until the very end of the Great War. In that interesting book, the letters and journals of Sir Robert Wilson, who was serving as an Attaché with the German Armies, now with the Prussians, now with the Austrians, his patronising approval of them is perhaps their strongest condemnation. "These troops," he says, "are not half so bad as people at home suppose, they would really fight very well if they had only a few good officers to lead them. They follow *me* very well wherever I go." So also in the interesting memoir by a French officer who charges at the head of a handful of cuirassiers into a large body of Prussian hussars and is taken prisoner, his captors apologise, so to speak, for having taken him prisoner. Had we known, they said, that your men were cuirassiers, (they had been out foraging in undress) we should never have thought of stopping to meet you. And now the case is, we know, entirely reversed. It is now a handful of Uhlans who ride unchecked over the soil of France; it is now the French who are beaten before they go into action, and cannot be got to face the Germans, on anything like equal terms. Such are the ups and downs which military history records. And it is important to notice that they are usually sudden and unexpected. Until the war of 1866 broke out, it was generally supposed that although the Prussians had been more than a match for the Austrians, the French would still be found to retain their traditional superiority. The downfall was sudden and unexpected, except by a few shrewd observers.

The military history of nations, then, is full of surprises. At the present moment the German Army occupies the position it did about a hundred years ago in public estimation, and, probably, in actual efficiency also. And yet, although history in one sense does not repeat itself, we may feel sure that the champion's belt will not always remain in the same keeping; that there are causes which have acted in the past which will also act again in the future to bring about, sooner or later, one of these changes. Now, what are the causes which produce these reversals of relative position, and how can we guard against undergoing ourselves, a surprise of this sort. It may be said perhaps, without boasting, that the British Army has never fallen away as other armies have done from the proper standard. It has, indeed, reached the highest point in the military scale, for unquestionably, at the end of the Peninsula War, the British Army, small as it was, stood highest, and justly highest, in European estimation; and although our histories gloss over with slight mention many of our discreditable military episodes, still there has

never been a time when the British Army ceased to be held in respect, at least as a fighting machine. But it is not sufficient for success that the raw material should be good. The Prussian soldier at Jena was a very good one, the spirit of the Prussian officer was as high before that fatal day as it had ever been. Because a thing has not happened in the past it does not follow that it may not happen in the future. And, at any rate, it behoves all of us who have our share, however humble, in determining the character of the army, not be satisfied with a mere complacent taking things for granted. We should always be on the look-out to detect the first germs of any relative decline in our military institutions; we should always be "taking stock" of the materials, moral and physical, which make up the armies of nations, to see if those which we possess are up to the advancing standard of the age. Now, it would be but a trite remark to say here that this is an age of progress, especially in military science, in the development of arms of precision, and in a variety of other ways. Nor should I venture to touch on this subject here in the presence of so many who are better qualified than myself to speak about it. But I do not believe that the secret lies in these. Inventions and improvements in arms and tactics soon become the common property of nations. I would rather employ the few minutes available in endeavouring to find another answer to the question suggested by what has gone before—wherein lies the cause why now one army, and now another, attains the supremacy? Perhaps it will be said, the cause is to be found in the superior generalship exhibited on one side. This, however, is merely to shift the question a little further. What are the causes which go to make up the successful generalship which produce these great results? Many of those present will no doubt be ready with an answer: it is his quickness of perception, his firmness, his energy, and so forth; but I should prefer to give one of a somewhat different kind from that which is usually offered. I might exemplify the point by the case of Frederic, or Napoleon, for I believe the secret is in all cases the same, but I would rather go for an illustration, and a type to aim at, to the conclusion of the great civil war in America. The lesson to be learnt from that war is, I believe, not studied by officers in this army as much as it should be. In one sense indeed there could be nothing less like the conditions of Indian warfare than those of the war carried on in America. It was war waged between two parts of the same nation, in which the interests and passions of both sides were excited to the highest point; it was war made with newly raised armies; the campaigns were conducted often over almost uninhabited or desert tracts; and some of its most bloody and desperate battles were fought in a very enclosed country, where manœuvring, as we understand it, was impossible; and where the General could not see his troops, and almost everything was left to the individual spirit of the soldiers and the subordinate officers. Nothing then could be less like the circumstances under which war is conducted by us in Asia, with mercenary troops, usually in a highly populous country, and one in which there is every facility of out-manœuvring

or being out-manceuvred. But the instructive part of these wars, the point on which they are universally applicable, is the extreme originality of conception which marked the strategy displayed. I would invite the attention of all those who are interested in the study of their profession, to a most valuable book just published, "The Military History of General Grant," written by General Badeau, who occupied an important place on Grant's staff. The book indeed, I think, labours under the fault of not making sufficient allowance for the difficulties under which the Confederates laboured, in the exhaustion of all their resources. But it completely disposes of the popular assumption that Grant was distinguished merely for dogged pertinacity and blood-thirstiness; it reveals him as a strategist of a high and quite original order. For he was never satisfied with merely winning a battle. The aim and object he put before himself, from the very beginning, was not merely to defeat the army to which he was opposed, but to destroy it utterly. He had been entrenched outside the lines of Richmond for nearly a year, and to the world in general the capture of Richmond and its defences seemed to be the aim and object of the campaign. But no sooner does Lee with the remnants of his gallant troops begin to evacuate their blood-stained lines, than Grant gives no longer any thought to the place. His army does not even take possession of their dearly won prize; he leaves a weak brigade or so behind, and sets off to capture the real object of his attack, the army opposed to him. If Lee could have got away with the remainder of his army into the wilds of Western Virginia, a country as yet untrodden by hostile forces, and abounding in resources, the war might have dragged on for another year or more, or might have had a different termination, for the North was just then greatly discouraged and weary of the contest. The restoration of the union, therefore, a result of extraordinary importance to the whole world, as well as to America, was due to Grant's original conception of capturing the enemy's army, and to the extraordinary pertinacity and resolution with which he carried it out. Napoleon's success, I need hardly say, was due also to the originality of *his* conceptions, and to the vigour and energy which he employed and succeeded in imparting to his troops. So also Grant's conception was, in its turn, quite original and peculiar, carrying the conception of successful war to a much further point than that at which Napoleon had left it. The capitulation of Ulm was thought to be an unprecedented feat, when 30,000 men were forced to lay down their arms; but Napoleon's strategy generally was limited to the idea of shattering the enemy's lines, breaking down their morale, and frightening them into suing for peace. Grant's ideas went far beyond this. Each in his turn was quite original and unconventional, and herein in each case lay the secret of success.

If we turn now to the Franco-German war, it is impossible not to see that the Germans borrowed the conception of their strategy from what had happened in America; the idea of taking a whole army prisoners had now for the first time presented itself as within the range of practical warfare. The genius was exhibited in adapting the new idea to circumstances, in taking the measure of their opponents

so thoroughly that an army ventured to surround and blockade, and eventually take prisoners another huge army, almost as large as itself.

I ought, however, to mention that this splendid conception was first formed and acted on by our own countryman, although the application was made on another element. Until the time of Nelson, a naval victory had usually but little to distinguish it from a drawn battle; if a ship more or less were captured it was called a victory, and everybody supposed that all was done that could or should be done. It was Nelson who first conceived and carried out the idea of capturing the whole of the enemy's fleet, and destroying their entire navy. But we are dealing with the land, and now to turn to ourselves—has it been our practice, we may ask, to destroy the whole of the enemy's army, or to take it prisoner? Has not our mode of making war been altogether too much of a formal and conventional character? It may be said, perhaps, the physical obstacles of climate prevent in our case that vigorous pursuit without which a battle gained is only half-gained. I was not thinking only of India, however, but of our way of going to work generally, although on this head I might venture, as they say when proposing toasts, to couple with the name of the British army that of mounted infantry, as possibly offering in the future a happy solution of what may be termed a standing difficulty. Not, however, that it is sufficient merely to keep up with the level of the times. That is a necessity of course. The point I am making for, is, that in war, the great, the startling successes which make or mar the destinies of nations, are won by the men who aim at something higher than the conventional standard of the day, and strike out an original line. Did time permit I could enlarge on the extraordinary originality and absence of convention which marked the operations of the American war, the marvellous way in which their huge armies were fed, the engineering feats in the passage of swamps and rivers, the industry shown by both sides in the construction of field works, and especially the use made of mounted infantry, for the so-called cavalry of Sheridan, which headed Lee's army in its retirement from Richmond, was in fact mounted infantry, fighting on foot, and with rifles instead of swords. But this is merely to describe the past; you cannot go on repeating the dodge of taking the enemy's army prisoner; and the point I am contending for, is, that in war the success rests on the side which abandons the conventional, the received ideas up to that time, and strikes out a new and original line.

Perhaps it may be asked, what will be the next form of development which is to turn the tables? What is the new form of strategy which is to take the world and the enemy by storm? Well, the man who could answer that question would go far to solve the problem. I will turn to a more practical point. I have dwelt so far on the genius of the general, but the criticism will no doubt have occurred to you, that this is not everything; no amount of ability will suffice if it has not got the proper material to work upon. And the second point I contend for, is, that success goes with discipline. The two things no doubt are usually found together; a good general makes

good troops; but they are not always found in conjunction, and it may be asserted without contradiction of what has gone before that, in war, the greatest successes have always been won by the best disciplined troops. This is admitted to be true of the Prussian army, both that of Frederic and of Frederic Charles; but it is equally true of the French army under Napoleon. Not discipline as conventionally understood, perhaps, but in respect of the capacity for answering to the call of their general, and making great efforts, under fatigue, hunger and cold;—and surely that is the real test, for what is the aim of discipline, what is the use of an army if not for this?—the discipline of Napoleon's army was better than that of any in Europe. And for another pointed illustration of high discipline of the unconventional but really useful kind, I would turn again to the American army under Grant. Unconventional indeed it certainly was when the troops, as a credible eyewitness informed me, called out as a general officer rode down the line: "there you go, gin'ral, you've got a new hat; git along, gin'ral, we see you;" remarks like this are utterly opposed to anything to be found in the Queen's Regulations; but these same troops, which had been lying in their entrenched camp for the long winter months, and which had not even the elation of previous victories to carry them along, for up to this time Lee and his gallant troops had foiled all their efforts, started off at the call of their leader in pursuit of the enemy retiring from the entrenchments of Richmond and Petersburg; pressing on through woods and marshes and across rivers, without rations, marching twenty hours out of the twenty-four, always pushing on, heading the enemy at every point, giving and taking no rest: Grant's army in a week of marching and fighting, in which, as their general said, they proved themselves as ready to die of hunger and fatigue for their country's sake as from the enemy's bullet, wore down and captured their enemy's army of 70,000 men, and thus, by one stroke, put an end to the war, displaying in the effort military qualities equalled only by those of their unfortunate adversaries, who laid down their arms only when the physical capacity to bear them no longer remained in their exhausted frames.

This then is the second point I wish to make for. Have we sufficiently realised the fact that great successes in war are now to be achieved only by extraordinary exertions? Does not our ordinary conception of making war partake too much of the conventional? Is our cavalry always ready to strike in at the critical moment, to cut itself loose from its communications, and getting behind the enemy, as did that of Sheridan,—regardless of the losses it suffers, so long as it inflicts greater losses on the enemy—to finish the war at a blow. Is our discipline such that we can call on our troops to make such efforts as these, that we shall find them as ready to die of hunger as of the bullet, at the call of their general? Our case it may be said is different. We are fighting with mercenary troops, with peace establishments, which need to be nursed and taken care of, because they cannot be easily replaced; and, moreover, in our wars, no great national passions are aroused. Granted, but still the fact remains,

that the day has gone when great things can be achieved by the old conventional way of merely winning a battle, and then stopping to see how the enemy takes it. The winning the battle is now merely the beginning, and not the end of the business; and we may depend on it, that in any army in which a conventional standard is maintained of this kind, and it is said that only a certain amount of effort can fairly be demanded of the troops, and that when a certain amount of marching and fighting has been got through all is done that can be reasonably expected,—depend on it, that army comes short of the standard necessary for great achievements.

These then are the two points which I have endeavoured to bring out, that success in war comes, not to the general who fights best on the old lines, but to him who strikes out a new line; and that to strike the decisive blow he must have troops disciplined up to the point where he can rely on their answering a call for extraordinary efforts. Genius and discipline then are the two factors of success. And yet the further criticism will no doubt have occurred to you that these alone are not sufficient. True, talent, and science, and training, are all very well, but over and above these there is still the one thing needful. I remember many years ago hearing or reading a story about a fairy and a sailor. The fairy, for some reason or other which I forget, was very much pleased with the sailor, and promised to grant him any three wishes he might ask for. Well, for his first wish, the sailor said he should like to have a whole mountain of baccy; for his second wish, he named an ocean of grog. Good, said the fairy, now for the third wish. Well, the old tar rubbed his head and turned his quid; at last he said he thought he should like a little more baccy. Well, paraphrasing the worthy sailor's sentiments, and paradoxical as it may seem to say so after what has been said already,—although I think there is really no contradiction in the assertion, I should be disposed to say that there are three qualities, and only three, needed for success in war, for the general as well as the soldier:—the first of these is courage; the second is—courage; and the third is—courage. Happy the man who possesses this invaluable quality; happy also the man who, not possessing it, is yet able to conceal the deficiency.

REMARKS BY HIS EXCELLENCY THE VICEROY.

His Excellency the Viceroy, in rising to return thanks to Colonel Chesney, said:—I do not know whether there is any gentleman who would wish to make any remarks on the lecture which we have just heard. (After a pause His Excellency continued): If no one is bold enough to take that course, although we have been exhorted to display courage, and courage, and yet again courage (laughter)—I will request those present to perform a duty which I am confident they will discharge with the utmost readiness—to return their cordial thanks to Colonel Chesney for the very interesting lecture which he has delivered (applause). Nothing would be more out of place than that I, who am a mere civilian, should attempt any criticism, or venture even on any general remarks

upon the lecture we have heard from such a distinguished military officer as Colonel Chesney; but at the same time there are one or two observations which suggest themselves to me, which, perhaps, I may venture, without impropriety, to submit to you in connection with that lecture.

Colonel Chesney has laid it down that, the secret of the success of the great generals who have successively followed each other in the world's history, and who, one after another, have won triumphant positions for their own countries, has lain in the possession by those generals of originality, vigour, and energy of character.

Now, it seems to me, Ladies and Gentlemen, that there is every antecedent probability that that dictum must be true; because, I believe, it to be just as applicable to all other professions in life as Colonel Chesney insists that it is applicable to the profession of the soldier (applause). I believe that the secret of success, whether of the public man, of the civil governor, of the great head of an industrial undertaking, or of any who are engaged in any of the great walks of life, lies, as Colonel Chesney has said, in the possession of those great qualities—originality, vigour, and energy. It is by originality to conceive, by firmness to pursue the plans which he has conceived, and by untiring energy in that pursuit, that the statesman attains his ends (applause), and it is by the possession of like qualities that success may be attained in any other of those undertakings to which men may devote themselves. (Applause).

But then Colonel Chesney said—turning from the generals of whom he had been speaking to that other branch of the army, namely, the officers, and private soldiers, without whose skill, and endurance, and courage, the greatest generals of the world could effect nothing (hear hear).—Colonel Chesney said that the second great secret of military success is to be found in discipline, as he has defined it; and it seems to me, speaking with all due diffidence in the presence of distinguished soldiers, that the definition which he has given of true and high discipline is a very sound and correct one (applause). He says—what you want, is, that you should have an army which is prepared, if need be, to cast itself loose from its communications, to advance boldly to the attack of the enemy without counting its own risks, and to be prepared to endure not only the hazards of battle, but the trials of sickness and the weariness of the long march (applause). Ladies and Gentlemen: I accept that definition of true discipline, and I have only to go back some two years, to find a brilliant example of it in the annals of the Indian army (applause). Was there not a famous Division which, upon a great occasion, cast aside its communications to an extent which frightened not a few Members of a distinguished assembly across the water (applause and laughter), and which, setting out without any means of communicating with its rear, endured the trials of a long and weary march in the climate of Afghanistan—cut off from all communication with the outer world for some weeks—to come forth at last from all its dangers to a signal and glorious victory. (Loud and continued applause). At least we may say that that

column of European and Native troops, prepared by the skill and forethought, and the noble self-denial, of my gallant friend the present Commander-in-Chief (loud and continued applause), and led forth with his accustomed energy, originality and vigour, and his no less remarkable good fortune, by my distinguished friend Sir Frederick Roberts (continued applause), not only re-established the fame of the army of India, but fulfilled all the requirements in regard to discipline of the gallant lecturer himself (applause). I ask you now to accord, as I know you will, your heartfelt thanks to Colonel Chesney for a lecture, most interesting in itself, and possessing, what I take to be one of the most distinguishing features of a really good lecture—that it was in the highest degree suggestive—that it brought forward points upon which the lecturer touched only as he passed, but which I venture to think may produce much fruit in the minds of those who heard and will read it, if only they will reflect upon and develop the hints which Colonel Chesney gave. (Loud and prolonged applause).

Mr. Leod Jones

UNITED SERVICE INSTITUTION OF INDIA.

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The Council give notice that the Institution Gold Medal for 1883, will be presented for the best Essay on—

“The Volunteer Force of India—Its present and future.”

The following are the conditions of competition:—

1. The candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 pages of the size and style of the Journal.
3. Essays must be received by the Secretary on or before the 1st May 1883.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the candidate inside.
5. The Essays will be submitted for decision to referees chosen by the Council.
6. The name of the successful candidate will be made known at the Annual meeting and his Essay will be printed in the Journal.

By Order of Council,
A. D. ANDERSON, MAJOR, R. A.,
Honorary Secretary.

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A. D. ANDERSON, MAJOR, R.A.,

Honorary Secretary.

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The Secretary will be happy to send an index to Volumes I, II, III, IV, V, VI, VII, VIII, IX and X, to any member wishing for the same.

A. D. ANDERSON, MAJOR, R.A.,
Honorary Secretary.

ORIGINAL PAPERS.

I.

BURMA.

TEXT OF A LECTURE DELIVERED AT THE ROOMS OF
THE INSTITUTION, AUGUST 26TH 1882,

BY

R. H. PILCHER, ESQ., C.S.

Deputy Commissioner, Burmah.

THE HON'BLE C. U. AITCHISON, K.C.S.I., LL.D.,
in the Chair.

The indigenous races inhabiting Burma are very numerous, and almost defy classification. To start with, three or four broad divisions may conveniently be made, as follows:—

(1). The Burmese who occupy Arakan, the upper valley of the Irrawaddy, with the plain country east of it, and the upper valley of the Sittang.

(2). The Talines, who are found in the lower valleys of these two rivers and down the Tenasserim Coast.

(3). The Karens, who live mostly at the southern extremities of the Arakan and Pegu Yoma mountains, in the mountains east of the Sittang river, and in the hilly parts of the Moulmain and Tavoy districts.

(4). The Chins, and a large number of other rude tribes, who live in the mountainous country which lies east of Arakan and which surrounds Burma proper on the north-west and north.

(5). The Shans, a race of which the Siamese are a part, and who inhabit the country, mostly mountainous, which lies east of upper Burma.

Of the Burmese, who are the dominant people, I shall have most to say, but this had better be left till later. The Talines, up till the time of Alompra, about a century ago, formed a separate kingdom, of which Pegu was the capital. They were frequently at war with the Burmese, whose territory extended as far south as Prome and Toungoo. About the year 1760, they had conquered and over-run nearly the whole of their rivals' country. Alompra, till then a hunter, gathered forces, and obtaining one success after another, drove them back, and finally succeeded to the throne of Burma. Not content with this, he completely subjugated the Talines and carried his aggressions in every direction from Manipur to Siam. Since then, the Talines have been rapidly losing their distinctness as a race and amalgamating with the Burmese. Their language, which though monosyllabic like the Burmese,

is otherwise totally distinct, is dying out, and even in remote places Burmese is taking its place. Physically the Talines are not widely different from the Burmese, they are much fairer in complexion, and have rather a more pleasing expression of face, owing, perhaps, to the set of the eyes being less oblique, and other slight differences, which I find it hard to describe. I think too they are rather more stoutly built.

The Talines seem to have established themselves in the valley of the Irrawaddy before the Burmese, and to have been driven by them gradually southwards. What the origin of the race may have been, there is not even a tradition to show. It used formerly to be inferred from the resemblance of the word Taline to Telingana that they came from India—a whimsically absurd hypothesis, though doubtless from time immemorial, there has been communication by sea between the two countries. The late Mr. C. J. Forbes, who was learned in such matters, makes out a fairly good case for the supposition that the Talines, Cambodians, and certain hill tribes in Siam, are of the same stock. And he infers that these latter emigrated from Pegu to their present seats. However this may be, the Talines seem to be the oldest of the many tribes with which the Golden Chersonese is now overspread.

The Karens are much ruder, less civilized folk, than their Burmese and Taline neighbours. In complexion quite as fair as the latter, or fairer, they have by no means so lively an expression of countenance. Their stature is about the same, but while the Taline is usually stout and looks well-fed, the Karen has often rather an ill-nourished appearance, as if he had too much labour and too little food. And in fact, probably, the Karens live much harder lives.

When one speaks of Karens it should be understood that many tribes are meant. The country in which they live is mountainous and their villages are isolated, and often at hostility with each other. They have little communication among themselves, or with the people of the plains; and the wonder is, not that they are so rude in their manners as they are, but rather that they are not even less civilized.

They cultivate permanently what little level ground there is in the valleys; but most of their fields are hill-sides, cleared one year and abandoned the next, or the next but one. And thus a large area supports but few families. The dialects they speak are almost legion. It is said that cases have been known where the descendants of families who have migrated over a range or two of hills have in three generations developed a patois of their own, so different from that of the parent village, that the third cousins have been unable to understand each other. Amongst the Karens, especially in the east part of the Toungoo district, the number of different dialects is very large. Probably I am under the mark when I say that at least ten could be enumerated in an area fifty miles by fifty.

Of the history of the Karens, little or nothing is known. The most probable hypothesis is that they are later immigrants than the Talines, Burmese, or Shans; and that they have gradually forced their way southwards from Thibet or western China, keeping exclusively to the mountains, just as the Kachins are doing now east of Bhamo. Their

language is monosyllabic and the words are made up of the simplest vowels and consonants; but there are no less than six tones, each of which gives a distinct meaning to the word pronounced in it. Of such unstable languages as this, possessing no writing of their own, it is to be feared philology will never be able satisfactorily to trace the origin. Were it otherwise, we know that Yunnan and Szechuen are largely occupied by wild tribes resembling these Karens, and it might be hoped that some day the kinship would be traced.

Of the Chins, and various hill tribes inhabiting the country north and west of Burma, we have in late years learnt a good deal through British officers placed in charge of the Hill-Tracts, as they are called, of Chittagong and Arakan. They are even ruder than the Karens, and away from the restraint of a strong government, every village or clan appears to be perpetually at feud with its neighbours. On the British side of their habitat they are strictly held in check. In Upper Burmah and the Northern Shan States, certain tribes, chiefly that known as the Kachins, or Singphos, are continually at war with their more civilized neighbours. And I am told that on the northern frontier of the Shan State of Theinnee these Kachins are gradually displacing the Shans. They are a turbulent, quarrelsome race apparently; and though small in stature and utterly devoid of any civilization but what is implied by a rudimentary knowledge of agriculture and metallurgy, they are yet hardy, and at all events in their vendettas, persevering.

With the exception of the Burmese, the Shans are, of all the races I have mentioned, the most numerous and powerful. Several clans of them occupy the southernmost valleys of Yunnan, and from there to Bangkok there is an uninterrupted succession of Shan States. Unlike their less civilized neighbours, the Shans or Tai, as they call themselves, all speak dialects of the same tongue and are more or less intelligible to one another. Those of Yunnan and those east of Burmah in writing use a modification of the Burmese character, while those of Siam use a distinct alphabet. The Tai or Shan language is, like those of most of the other races I am describing, monosyllabic and tonal. That is to say, whereas in English, we differentiate individual words by combining various syllables, and use tones to express various shades of feeling, these Turanian people use, for the most part, words of one syllable only. And since they can only form a limited number of such syllables, they use tones to differentiate their meaning; and to express the shades of feeling I speak of, they have to fall back on particles. The analogy in this respect between such languages and the Greek is at once obvious and surprising. For instance, by the intonation with which the English word "no" is uttered, may be expressed reluctance, deliberation, interrogation, anger or decision, eagerness, and doubtless other feelings. Whereas the same vocable in one of these Indo-Chinese languages would from these five or six different intonations acquire five or six totally different meanings.

To the unpractised ear it is difficult to make these nice distinctions clear. But every one knows the difference between two of the tones I speak of, the one in which an impatient man gives a downright

refusal, and the other in which one says "no" interrogatively. The effect of their use in speaking must have been noticed by every one who has heard Chinese spoken. And the curious sing-song sound produced is more remarkable in Shan than in Burmese, or even Chinese.

In build, face, and dress, as well as in their mode of life and industrious habits, the Shans resemble the Chinese more than they do the Burmese. They are so fair that, like the hill-people in this neighbourhood, their faces are sometimes ruddy and sun-burnt. Their eyes are set more obliquely and the mouth and jaw are broader. Their stature is rather taller too, I should say, than that of the Burmese. Their dress is the Chinese short wide jacket and baggy trowsers, blue or white, and by these the casual visitor to Burma cannot fail to distinguish them in a crowd. Though more industrious, they are rather less warlike than the Burmese, and they have hence long been subjugated and governed as feudatories by the latter. The Burmese enumerate ninety-nine Shan districts. Of these, Theinnee and Theebaw in the north, and Monai and Nyoungyue in the south, are the districts of which one hears most. Probably they are the most populous and the most independent. Burmese interference in the Government of these districts or States is usually limited to the receipt of tributary gifts presented thrice annually at the Kadaubweh, a festival to which reference will be made further on. Each has its own Chief or Saubwa who manages its internal administration, appointing his own headmen of villages and subordinate chiefs.

In time of war these chiefs have to furnish contingents of troops. Occasionally, or rather, very often, they are disloyal or give offence in some way or other, and are summoned to Mandalay to answer for themselves. If their misdemeanour is serious, they may be deposed for a longer or shorter time. During their deposition a Burmese official may be appointed to do duty for them. As a rule, however, this is not found expedient. The people dislike foreign rule and chafe under it; and it is more commonly a member of the *de jure* chief's family that is appointed in his place.

The administration of the Chiefs is of course rude, but it is doubtless suited to the people. I once enquired of a Theinnee Shan whether there was any such thing as a jail in his country. He replied that there was not; but they got on very well without; a thief might perhaps get off by making restitution for his first crime; but for his second he would be put to death. And justice is no doubt roughly but adequately administered by the local officials and by the elders of the people themselves. I have never travelled or lived among Shans, and beyond geographical information there is not very much to be learnt from the account of Macleod and Richardson's journey among them. How far their government succeeds in fulfilling its duties, I am unable to testify. In the plains, among orderly peaceable people, the Shans are also orderly and peaceable enough, but in their own country, it is probable that blood feuds and petty internecine hostilities are only too common among them. One of their customs, not otherwise worth mentioning, is remarkable as being

suggestive of this. Nearly every grown-up adult has a line of from two or three to ten or fifteen little black round dots, of about the diameter of a pea, like tattoo-marks, on the skin of the front or inside of his arm from the shoulder to the elbow. These are charms to secure the wearer's life against steel and bullet. They are made by scratching certain characters on a thin plate of silver the inscribed portion of which is then cut out and inserted under the skin. What the characters are, I do not know, save that they consist of chequers and figures in which most Orientals imagine some special virtue to reside. But the main virtue of the charm consists in its being written in a certain way. In tracing it, the operator must either work under water, or he must hold the silver plate in a spot on the floor of the house where a single ray of the noonday sun shines in on it through the roof. What the effect of this on the operation is supposed to be I have never heard. The universal use of such charms, however, is strikingly suggestive of a corresponding practice of shooting from behind a hedge, such as one hears of among some more enlightened nations.

The Shans, while Buddhists in religion like the Burmese, are less learned and know less about the rules of their religion. Among the people generally there are fewer who can read and write. The alphabet they use is imperfect, owing to the want of any signs to indicate the tones, and reading is necessarily difficult. Their priests too are more ignorant; they have no schools, or rather one ought to say, no university such as that kept up at Mandalay, so that if they would become learned they must go to Mandalay and master Burmese first, and through it Pali before they can obtain access to Buddhist literature. It is notorious that a monk of little learning from Burma obtains great honour among the Shans. Their own monks indeed are not only unlearned, but also somewhat lax in discipline. Not that they fail in the main virtues of temperance, chastity and the like, but they smoke tobacco, possess valuables, and generally, in their behaviour and deportment, fall short of exact conformity with the rules of their order. For their zeal, however, in one kind of religious work I must not omit to give them credit. Both priests and laymen, but chiefly the priests, and especially those of the Chinese districts, are much given to pilgrimages. In making these, they sometimes travel enormous distances. Every year, for instance, parties of thirty, forty and fifty people, come down from the Chinese Shan districts to worship at the great Shway Degone Pagoda at Rangoon. Such parties usually consist of an old priest, or abbot, with a few monks, and a score or two of laymen, men, women and children in attendance on them. The homes of these people must be at least eight hundred miles from Rangoon, often a thousand miles and more. But once on the river, they come down from Bhamo or Mandalay in a week or so by steamer, and the distance is thus much less than it seems.

At the time the new "tee" or "umbrella" was placed on the Rangoon pagoda, I am told that it was Shans mainly who did the real work. They covered the whole of the enormous structure with bamboo framework, and hoisted the thin iron hoops one after another into position.

And of the varied collection of treasures then deposited at the summit, and still remaining there safe from all human depredation, not the least valuable contribution was a solid image of Gautama, of pure gold, dedicated by the Shans.

Of their religious beliefs and practices, beyond what I have already said, I know little or nothing. Every religion introduced among a people from without, receives from them, I suppose, in the course of time some modifications. In what respect this has been the case among the Shans I am unable to say. Their folk-lore is curious. The stories they tell of dragon-kingdoms, wizards, enchantment, and the like, though probably derived to some extent from Buddhist sources, are certainly of a different character from those current among their neighbours, and it is possible that enquiry might prove them to be of considerable ethnological value.

Of the Burmese themselves, obviously, I can here give but the merest sketch. Those who care to learn more will find in Forbes' "British Burma," Yules' "Mission to Ava," Crawford's "Court of Ava," and other books, abundance of information. But a good deal that is interesting yet remains to be written. We still want, for instance, a good account of the revenue and expenditure of Upper Burma; a description of the peculiar superstitions and religious beliefs of the people, for along with Buddhism many of their ancient popular superstitions or beliefs still linger; and much else is to be desired, but first and foremost a history of the Burmese people. After saying a little about the people as they at present are, I had intended to try and describe more particularly their system of Government in some detail, in order that, if possible, even those who know something of Lower Burma might glean a little information from this lecture. But that intention I have been able, for obvious reasons, to carry out only to a very limited extent. I think the chief point in which Burma generally differs from India, is that the population bears a smaller proportion to the area, and that hence the people are wealthier. To this cause, no doubt, is partly due the cheery contentment which is every where to be remarked among the people. Hence it is that the trade is flourishing and that the seaports are crowded with ships and people of all nationalities. And hence it is that in Lower Burma two thirds of the revenue raised suffices to pay for all the cost of administration, the other third being contributed to the imperial exchequer.

Of the origin of the Burmese the most probable hypothesis seems to be that they immigrated from Thibet, somewhere about what is now Nepal, and gradually made their way eastwards down the Himalayas and through Arakan to their present seat. However this may be, it is certain that the tide of migration sets in that direction; and at the present day there are not wanting kindred tribes along the whole of the route I have mentioned. The similarity of the Burmese to various hill-tribes of the Himalayas in complexion, features, and build, must have been remarked by all who have seen the two. Many of the Goorkha sepoys even would pass for Burmese if properly dressed, and in photographs of Nepalese women I have noticed a still more remark-

able resemblance to the Burmese type of feature. The immigration must, in any case, have taken place at a very remote period, for the Burmese have acquired a considerable degree of civilization, presumably since then. And their traditions, corroborated by a good deal of external evidence, go back centuries before the commencement of our era. Of the histories of Prome and Tagoung, the two most ancient capitals of the Kingdom, what remains there are, can hardly be of much value. Prome is said to have been founded in the year 373 B.C. The capital was removed to Pagan in A. D. 107. Pagan was deserted about the end of the 13th century and the capital, after having been moved first to Panga and then to Sagain opposite Ava, was finally, in 1377, fixed at Ava. There it remained till about 1750. It has been moved several times since. Mandalay was founded only some twenty five years ago. Thus the movement of the main body of the Burmese seems to have been up the Irrawaddy from Prome, and the fact that this was one of their earliest settlements, points to Arakan as the place whence they came; the hills being there easily crossed.

The features and physique of the Burmese are sufficiently well known not to need description. They are, as a rule, thick-set and robust, and in early manhood the men are notably fleshy and muscular. If not handsome, according to our taste, in feature, they usually wear a pleasant jovial expression, the outcome of a companionable disposition, which compensates for the absence of beauty of a western type.

The social position their women occupy is, perhaps, next to their comparative wealth, the most remarkable characteristic in which the Burmese differ from the people of India. Though in accordance with the teaching of Buddhism women are held to be less worthy than men, since before attaining to a higher existence every woman must be born again as a man; and though in their families and in public assemblies they occupy inferior places; yet, in point of fact, they enjoy a degree of freedom and independence scarcely paralleled among Western nations.

Marriage is a civil contract practically dissoluble at the wish of the parties. It is usually contracted by the parties themselves of their own choice. And thus tyranny on the part of a husband is unlikely, and indeed impossible, if the wife has spirit enough to resist it. About half of the trade of the country is carried on by women, though the men usually do the wholesale business and such as is of a specially laborious character. Thus every woman can, if need be, earn her own livelihood; and it sometimes happens that the wife alone works and supports her husband in idleness. The option of divorce which both man and wife have acts as a check on behaviour. The right is not so often exercised as might be expected, for, apart from the obvious inconvenience attendant on such an extreme measure, it is considered disreputable, and persons who have been divorced are regarded with suspicion. There is indeed a proverb to the effect that a novice who thrice changed his monastery, and a woman who has been thrice divorced, must be utterly worthless people. Notwithstanding, or perhaps rather in consequence of, the freedom wives enjoy, their behaviour is good and

conjugal infidelity is rare. There is in fact in every village and in every quarter of a town a sort of public opinion, which, like that of caste brethren in India, regulates to a large extent each individual's conduct. Such a loose marriage tie must of course have an evil effect in weakening family bonds and making the people, as a whole, less orderly and coherent; but the institution is of course suited to the people who have evolved it. It is certainly consistent with a very large exercise of chastity and other domestic virtues to which more advanced nations owe much of their progress.

The Burmese language is monosyllabic and has three tones. It is written in a circular character derived from the Nagari. The spelling, though not very irregular, is yet not phonetic, and hence arises the perpetually recurring difficulty in transliteration. From the fewness of the intonations, the variety of consonants, the absence of inflection, and the general simplicity of its grammar, Burmese is not very difficult to acquire. It is true that many common words, such as "cotton," "bamboo," and "fat," are only distinguished by a tone. It is true that for a knife or a ship one must say "knife one slip," "ship one slip," for a cow or a tiger, "cow one animal," "tiger one animal," but there are only twenty or thirty of these numeral adjuncts, and these and other difficulties are as nothing compared with the mysteries of Greek verbs or the rules of Sandhi, or even genders.

The Government of Upper Burma is despotic. The King's power is absolute. The administration is conducted, however, through ministers whose number, rank and functions, are strictly defined by constitutional precedent. I use the term constitution in its proper sense, for though, from the idea of political freedom it conveys, the word almost seems inappropriate as applied to a despotic system of Government, yet it must be remembered that the history of the Burmese, as a nation, goes back almost as far as our own. If the present dynasty is of no very long standing, yet the kingdom is ancient. Witness the remains of the former capital at Pagan, where, owing to a singularly dry climate, innumerable ruins of old pagodas still preserve something of their former magnificence and attest the wealth and artistic culture of their builders. These remains date as far back as the 10th century I believe; but sites of much older capitals exist at Tharekhettara close to Prome, and at Tagoung in Upper Burma, between Ava and Bhamo. Neither of these localities has yet been much explored, but it is beyond question, from the histories of them that exist and from the traditions still current, that the cities which once flourished there were of great antiquity. All this being so, it is not surprising to find that the Burmese governmental institutions are also ancient and well-developed. As a matter of fact, not only is this the case, and not only are these institutions exceedingly elaborate even to the minutest details, but the court ceremonies and etiquette too are similarly refined and complex. Indeed, the latter form the subject of a voluminous work entitled "Laukabyúha" by a minister who took his title from the town of "Inyone," whence the book also is commonly known as the "Inyone Volume." I am not, therefore, straining the

meaning of the word when I speak of the Burmese constitution. Before proceeding to describe it further, I ought here to say that I have received much of my information from the Burmese Ambassador now here, who has been always ready to give assistance when asked.

The Burmese ministers are of two classes whose duties and position were in old times quite distinct though they are now more or less merged in each other. The one class consists of those whose authority and responsibility are confined to the Palace. Originally, no doubt, they were officers of the Household. The other class consists of administrative officers, properly so called, and as these are the more important, it will be best to deal with them first. This second class then constitute a Great Council of State called in Burmese the "Hloot law" or "Hloot," in which all administrative power is vested. The Hloot, or Council, as I shall for brevity's sake call it, thus discharges at once the functions of a house of legislature, a cabinet, and a supreme court of justice. It meets literally at the King's Gate, in a building situated in the esplanade or court-yard between the "Red" or main-gate, and the outer gate of the palace enclosure. The various ministers have small offices of their own not far from it, within the same space. The President of the Hloot is nominally the King himself, or in his absence, the Heir-Apparent, or some other member of the Royal Family. Practically, the Prime Minister usually presides. The officers who compose the Council do not seem to be divided by any sharply defined line as superior and ministerial, though their functions suffice to designate them as such. There are in all fourteen grades. Eleven of these grades comprise four, or not less than four, officers each. They are as follows—First, the Woongyees or Mingyees. The term "Woon," by which many kinds of officials in Burmah are designated, means literally a "burden," and metaphorically a "burden of affairs," or the bearer of it. Woongyee is hence "a great official." If the title had to be translated into English, "Secretary of State" would probably express it best. Each of these chief ministers has his own department, or departments, but the distribution of work is a personal matter and is never unalterably fixed. Indeed, though the Woongyees always have territorial as well as a host of other titles, even these are not attached to their office, or hereditary, but are given from time to time by the King.

It may, perhaps, be best to explain here that, in fact, there is no such wide differentiation of functions, such division of labour among the Burmese, whether officials or common people, as there is among European nations. Just as an ordinary Burman peasant builds his own house, catches fish, and, perhaps, shapes his own canoe, so the Woongyee has not only to consult about politics, revenue and finance, but to decide important civil and criminal suits, to direct military operations, and on occasion to take the field in person, as Generalissimo. Within the last month or two one of these officials died on his way home from a campaign in the Shan country.

Next to the Woongyees in rank, come two officers who, though they have a customary right to seats in the Hloot, yet do not often take a part, and have in fact little concern in its business at the present

day. These are the Myinzoogyee Woon and the Atheewoon. The former is the officer commanding the principal cavalry regiment, who appears to represent that branch of the service; and the latter is the officer in charge of "civilians," that is to say, persons other than those in the Royal service. He is, I suppose, or anciently was, their special protector.

After these two officers come the Woondouks, who, to carry on the analogy above suggested, may be called Under Secretaries of State. The second syllable of the title signifies "support," and hence these are the assistants of the Woongyees. Normally they are four in number, but there are often more, for the rank is occasionally conferred on governors of important provinces as a reward for good service. Properly speaking, the latter cannot perform any of the duties of the honorary rank since they are away from the capital and can never attend council. In Lower Burma, Woondouk is the term used, inappropriately enough, to designate an Assistant Commissioner. Probably the name was thus applied soon after the annexation and has never been dropped. Each of these Under-Secretaries has a department or departments assigned to him, and in some instances they are commonly spoken of as Under-Secretaries in this or that department. There is one, for instance, usually known as Under-Secretary in the Foreign Department. But the division of duties is not of course so clearly marked and adhered to as such a title might lead one to suppose.

As a rule indeed Woondouks, and all other high officials, are generally known by the name of some town or district. Formerly, like the Persian satraps in Xenophon's time, they used to have districts given them by the King to "eat," i.e. to govern, for their own and the King's benefit jointly. Most of the country was thus parcelled out in districts among various officers, some of whom managed their affairs themselves; while others, being great officers of State, must mostly have employed deputies. Doubtless the royal exchequer suffered by this arrangement. The Myo-za (literally "town-eater") as the governor of a district was called, paid a fixed annual sum to the king; and whatever he obtained by taxation or otherwise, over and above this yearly payment, was his own. The sums fixed were not heavy. Thus the district of Rangoon with its 32 towns, comprising one-third of the whole Irrawaddy delta, paid only about Rs. 10,000 per annum, and the Governor was in fact a petty independent sovereign. Even the steersmen or captains of the royal war-boats, who had large jaghirs or assignments of land, were practically governors of small districts, and throughout the delta country indeed the Burmese word for steersman meant this and nothing else.

The late king, many years ago, seeing no doubt the obvious disadvantages of this system of administration and the advantages of ours, abolished the former, and decreed that all officials should be paid by salaries which he fixed. At the same time the title "Myoza" or "Governor" was retained, and the officers so styled have still special charge of such business relating to their districts as is referred to the capital. Such an

arrangement must of course lead to some confusion, as for instance, when the "Myoza" of a frontier district disposes of business which properly belongs to the Foreign Department.

But to return to the Hloot or Council; the Woongyees or Mingyees (literally great rulers—the two terms are synonymous) and the Woondouks, have the chief share of authority. All important business is, in the first instance, submitted to them, and they have competent subordinates in sufficient numbers to relieve them from all burdensome details. They in fact, with certain other officers whom I shall mention later, form the ministry. The authority of the Woongyees is paramount, but less important matters are left to the Under-Secretaries to settle. The latter have the right—indeed it is always their duty—to remonstrate when they consider the Woongyees to be in error; and a Woondouk who happens to enjoy the special favour and confidence of the King would always have great influence with his superiors.

Next in rank to the Woondouks come the Nakhandaws or "Royal-listeners." Their function is that of carrying communications from the King to the Council and *vice versa*. They write these in large notebooks with gilt-covers, which are the insignia of their office. They too are four in number.

Of the Sayaydawgyees (literally Royal Clerks) or Assistant Secretaries, who come next in rank, there ought also by custom to be four; but as they have more multifarious work and are really very important officers, there are some score or so of them. Their position is somewhat analogous to that of the Registrar of a Court. They hold preliminary investigations in important judicial matters, and, subject to the minister's approval, decide unimportant cases themselves; and in general business it is they who do most of the actual executive work. All details are left to them, and hardly any business can be done in the Council without their aid.

Next to the Assistant Secretaries are the four Ameindawway whose duty it is to record and transcribe royal orders of all kinds, or, as we should say, Orders of the Government, such as, for example, those relating to appointments of officers, leases of forests, and a thousand and one other subjects.

The seventh grade is that of Athongsayay, officers who form a rudimentary Department of Public Works. They have to keep the public buildings in repair, and to build new ones when required.

Next in rank are the Ahmadawway, and after them the Away youk. The former are, what we should call, drafters perhaps. They prepare for issue all letters and orders sent out from the Council. The latter receive and read letters received from a distance—whence the title—and submit them to the ministers. These two classes of officers, and their assistants, are in fact the correspondence clerks.

The two Thandawgans, or receivers of royal letters, are ceremonial officers. Three times a year, the king holds a durbar called a Kadawbweh, which literally means "beg-pardon-festival." At this all high officials and feudatory chiefs, who can, attend and do homage to the King. Those who cannot, send letters which it is the business of the Thandawgans to read.

The Lessongsayays may be compared to the Indian tosh-a-khana clerks. They make lists of all gifts presented to the King and read them out at durbars.

The Yongzau is a sort of master of ceremonies. He makes arrangements for durbars, gives notice to the officers who are to attend, and informs them what business is to be done, what dress they are to appear in, and so forth. The Necha or Usher points out to each officer his place at ceremonial meetings of Council and Levées. The places in the Hloot are marked by little holes in the floor through which, anciently, an attendant waiting below thrust up the stem of each man's pipe, the bowl being held below. For among the Burmese smoking is not held to be incompatible with any grave employment; the prime minister, as he makes obeisance before the King, keeps his cheroot between his fingers; and ubiquitous as the cheroot now is, it has only recently taken the place of the pipe, its predecessor.

The Thissadawway, or oath-recorders, are employed to administer the oath of fealty to all who enter the King's service. The ceremony used is worth describing. The oath is first written down on paper and read over in a temple, before an image of Gaudama, the candidate repeating the words; the paper is burnt and the ashes are put into a cup of water; the water is then stirred with a small faggot in which the five kinds of weapons used by the Burmese are all tied up together; and finally the person to be sworn in, drinks the cup of water. The five weapons referred to are the bow, the spear, the sword, the cannon, and the musket. It is scarcely necessary to say that miniature models are used in administering the oath.

These then are the officers who compose the Hloot tau or Great Council of the Kingdom. I now proceed to enumerate those of the other order mentioned above whose functions are, or originally were, confined to the interior of the Palace. Their office, or place of assembly, is styled the Byeh-dike. The former syllable is, I believe, Taline or Mon, and means "bachelor," and thus the whole word means bachelors' chamber. Formerly, it is said, the King's young men used the place as a waiting-room; and the King himself occasionally came there to see his elephants exercised. Now, however, it is used exclusively as a public office.

Of this second order of ministers, the Atwinwoons form the first grade. Their title means "interior minister," and their duty is to transact business generally relating to the interior of the Palace, but especially to take up business from the Council to the King. They sleep in turn, two at a time, in the Palace, as indeed the officers of the Council also do. They go to their office at seven in the morning, and every second day they are relieved at three in the afternoon. At nine, the Ministers come in from the Hloot, and having discussed whatever business they have with the Atwinwoons for half an hour or so, go in with them to the King's morning levée. In the afternoon there is another informal audience termed "Boshoo," because military officers are then admitted with the Atwinwoons to see the King. In the evening, at about eight, the evening reception is held, and at this also

the members of the Hloot are present. Business of a special character is usually settled during the day. In the evening, all is quiet, strangers are not admitted, and general affairs of State of all kinds are discussed.

The relative rank of the Atwinwoons with members of the Council is not absolutely defined. In Crawford's time, it was said to be a moot point whether they were above or below the Woondouks. In these days they are certainly above them as a rule, the point being settled in individual cases by the degree of favour in which each man stands with the King.

Next in rank to the Atwinwoons are the Thandawzins. They are supposed to be always in attendance at audiences to take down the King's orders, and to transmit them to the Hloot. And they are always employed to bear forth in state from the Palace, royal letters, and to perform similar ceremonial offices. The Byehdikethanzin are merely chief clerks. The Seemeedoon-hmoo are nominally officers in charge of the lighting of the Palace, but they have more important work. They keep a record of persons sleeping inside the Palace and warn those concerned when their turn comes to remain all night. Any one found inside the main-gate after dark, whose name was not down in their books, would be liable to grave suspicion and to punishment.

The last grade of Byehdike officials are the Tindane-yan-hmoo. Their functions are rather menial than administrative. They look after the furniture and appointments of the Palace, and keep all in order.

Besides the Hloot and Byehdike, the public and privy councils, there is yet another very important public office in the Palace, the Shwaydike, or Treasury. This is, in fact, not only the Treasury but also the depository of the archives of State. Here are kept records of all kinds,—genealogies of hereditary officials, lists of the King's artificers, and many other documents. The King's artificers are hereditary servants, and the heads of their families are accounted officers of the Shway-dike. In charge of this office are the following:—

The Shwaydike	Woon	Officer in Charge.
"	"	So
"	"	Governor.
"	"	Kyap
"	"	Superintendent.
"	"	Sayay
"	"	Clerk.
"	"	Thaugyne
"	"	Doorkeeper.

The chief civil and criminal Courts of first instance, at the capital, stand, like the Hloot, literally at the King's Gate. They occupy a corresponding position to the East of the palace, but outside the external enclosure. The Civil Court deals with important business arising at the capital, and hears appeals from provincial and subordinate Courts. Appeals relating to landed property and hereditary offices, however, go to the Hloot, from whose jurisdiction no civil case is, at least in theory, excluded. The Criminal Court disposes of cases arising in the city of Mandalay, but not appeals. All criminal appeals also go to the Hloot. Judicial business is there, on occasion, transacted with great solemnity. When the Crown Prince, or any other member of the Royal Family, presides, the suitors, or their advocates, are alone allowed to appear in the first instance, the general

public being excluded. Both parties must be suitably dressed, and before they appear they are given long loose white coats to wear, and caps, of which the plaintiff's is green and the defendant's is red. These are provided at the public expense and are kept at the Courts. They are usually worn merely by the advocates for the parties. The members of the Council themselves never appear without their proper uniform, a fillet of white muslin round the head, and a loose muslin gown over a tight fitting white cotton coat. The analogy between the coats and caps and a barrister's gown and wig scarcely needs to be suggested.

The Myo-woons, or district officers, practically exercise full civil and criminal jurisdiction in all ordinary suits. Appeals in criminal cases, though under certain circumstances they are allowed, are said to be especially rare. Punishments are inflicted at the discretion of the judge, there being no penal code. In most instances the offender can get off with a fine or at least a money payment. Sometimes again, when crime has been so rife as to attract special attention, punishments more cruel than ordinary are awarded. If, as sometimes happens, a district officer has been unusually severe and is called to account, he can generally excuse himself on the ground that "his hand reached further than he intended," that is to say, that he acted hastily—his zeal carried him away.

Of Burmese ideas about the administration of civil justice, I had a good opportunity of learning something during my stay at Mandalay; for I then sat once a week or so with a Burmese judge in the Mixed Court. The character of judges for impartiality is not held in such high esteem amongst the Burmese as amongst ourselves. And, though they use the laws of Manoo to some extent as a civil code, their procedure is of course of their own making. Hence it is not surprising that in deciding civil suits the principal aim of the judge is, if possible, to satisfy both parties, the result being in almost all cases a compromise; and that ordeal is a recognized mode of determining disputes. I may here remark that oaths are not used as in our Courts on ordinary occasions. They are regarded as a kind of ordeal in themselves and are only taken in the last resort by one of the parties on the agreement of the other to be bound by the result. The oath is taken with great solemnity, before the altar, and a sort of festival is held on the occasion, the parties and their friends going, with a band, in holiday attire to the temple.

The Burmese say there are six classes of judges. First, there are the parties themselves who may agree together to some decision of their cause. Secondly, they may appoint one or more arbitrators of their own. Thirdly, there is the unpaid but officially appointed and recognized arbitrator whose court is termed *Khóng*. Above this are the court of the District officer, then the Chief Civil Court at the capital, and finally, the King whose authority is mostly exercised through the Hloot.

The commencement of a suit in Court is by the presentation of a written plaint, on which the judge commonly orders an assistant, called *na-khan* "listener" to enquire into the case and report. The *na-khan*

examines the parties and perhaps their witnesses, and presents his report. With this the parties submit their pleadings, *i. e.* full statements of cause of action, and reply or defence. A day is then appointed for hearing, advocates are chosen, and the case is heard. After the necessary examination of the parties and their witnesses, issues are fixed by the judge, who at the same time declares on whom the burden of proof lies. Thus the order runs "let the plaintiff prove so and so" and "let the defendant, if he can, prove so and so." Witnesses are examined after this, and judgment is given. If the parties agree to abide by the judgment, they both eat tea, and the judgment thus becomes final. If they do not so agree, they may appeal to a higher grade of Court. Sometimes, if the worsted party is considered unreasonable and contumacious, he is imprisoned for a time to compel him to "eat tea" and accept the Court's decision. The oath-ordeal is often proposed by one of the parties themselves. The Burmese are a very religious people and regard an oath with some dread. They are not litigious or quarrelsome. And thus A often says "if B will swear to his version of the story, I will be satisfied."

There are three other forms of ordeal. In one, two candles, one for each party, of equal size, and with equally thick wicks, are solemnly burnt on an altar in a temple, the deity having been first invoked, and that party is worsted whose candle goes out first. In another, each man's forefinger is wrapped round with feathers so as to leave the tip exposed. The forefingers are plunged in molten lead, and then tied up for a few days. If one party is injured and the other is not, the former loses. If there is difficulty in deciding which is more hurt, the fingers are pricked and the flow of serum from the one finger and not from the other determines the point. The third kind of ordeal is by water. The two parties go into sufficiently deep water, and their heads are pushed down with poles. He wins who can remain under longest. It is in these days allowed to undergo this, and, I suppose, other ordeals by deputy, a permission which seems to detract not a little from their value. But indeed they are not often resorted to. When Crawford visited Ava in 1826, however, this could hardly have been the case, for he even gives details of the various fees payable to those who assisted at the ordeals. Fees and presents were, at least in his day, so common that to take a man to court was to inflict a grievous injury on him. And indeed, at the present day too, the word "case" or "suit" has the same significant connotation he ascribes to it.

One of the principal items, the principal item in fact, of the revenue of Upper Burma is the capitation, or more properly the income, tax. The mode in which this is collected is interesting both because it shows that, in spite their despotic form of government, the Burmese yet enjoy some measure of political freedom; and because it furnishes a model worthy of attention, if not imitation, by us in the collection of analogous taxes in Lower Burma. To begin with, then, for the purpose of collecting this tax, apportioning or assessing the *tháthaméda*, as it is called, every district and town is classified according to its situation and

other circumstances affecting its general wealth and prosperity. According to this classification is fixed the rate at which the tax is to be assessed. The rate varies from six to ten rupees per annum on each household. In fertile prosperous tracts of country, within easy reach of river communications, the highest rate prevails, and in proportion as a district enjoys these and the like advantages in a less degree, the rate is lighter. A general knowledge of the condition of various parts of the country enables the authorities at Mandalay, to determine approximately the incidence of the tax in a general way. It is never fixed for more than one year at a time however. Various accidents, such as drought or fires in a town or village, and any other circumstances that affect the ability of the people to pay, are taken into consideration in the assessment. And where there has been serious calamity the suffering towns or districts are altogether exempted. Any such grounds of exemption are reported by the local officers, as they occur, in diaries submitted fortnightly to an officer at the capital, who, for want of a better title, may be called the Commissioner of the Division.

The tax is collected in April or May, either by the district officers or by special collectors, as the case may be. In some years all the work is done by the former, in others all by the latter; but usually it is done in some districts by the local officers and in others by special collectors. These are selected chiefly for their probity, and are deputed to prevent peculation. Whichever method is adopted, the procedure is the same. Instructions are, in the first place, issued by His Majesty in Council, as we should phrase it, to the officers who are to make the collections, directing at what rate per house the assessment is in each district to be made, the exemptions that are to be granted, and so forth. On receipt of these the collector proceeds about his work. His first task in each town or village he visits is to count the houses. This multiplied by the rate gives the amount payable by the village. The highest rate being by far the most common, 50 houses would usually represent 500 Rs. of revenue, 100 houses 1,000 Rs., and so on. The total amount payable by the village being thus calculated, it remains to determine the proportion payable by each individual householder. And it is the principle on which this is determined and the mode of procedure adopted in determining it, to which I refer as affording an example of local self-government in Upper Burma. The village quota having been fixed, the elders of the village are called together, and they, in consultation, settle the amount to be paid by each individual householder, according to his means. Discussion doubtless takes place, and objections are heard. In some instances disputes are settled perhaps by the collector or his assistant. But the principle is that each man pays according to his means, and that the vestry-men, so to speak, in each parish apportion the tax. Of course certain persons are exempt. Those who are physically incapacitated for work, those who by any accident or disaster are destitute of means to pay, the aged and widows, soldiers, sailors, and generally all Government servants, are excepted from the list of tax-payers. When this list is completed, the tax is collected, generally speaking, at once. Sometimes, if there is any reason

for indulgence, payment is allowed to be made in two or more instalments. The money when collected is sent, with the accounts, to the Commissioner or officer at Mandalay who is specially charged with the collection of this branch of the revenue. He examines the taxation rolls and accounts, and then pays the money into the Treasury, the Golden Chest, as it is called, which is in charge of an officer of the Household.

The principle on which the assessment of this tax is based is sound, and I should think that the method in which it is carried out is well suited to the Burmese character, and that in practice the system should work well. Indeed, as it is the one which the nation has evolved for itself, this could scarcely be otherwise. In Lower Burma we have, I believe, based our land revenue and capitation tax on the system of taxation which we found existing in the country and which I have above described. But it was perhaps inevitable that officers trained in India should introduce some modifications suggested by their Indian experience. And so our capitation-tax is levied at rates which vary in different districts from one to five rupees, but every householder, rich and poor, has to pay the same. Our land revenue in Lower Burma is collected on all cultivated land at rates, varying according to circumstances, from less than one rupee to five rupees an acre. In Upper Burma there is, with a small exception which I shall speak of hereafter, no land tax at all. Our land-tax is of course an admirable form of taxation, and may compare favourably with the Burmese "tháthaméda;" though *prima facie* the presumption in such cases is in favour of the greater suitability of an indigenous system. And indeed we have scarcely yet had sufficient experience to enable us to say what will be the effect of our more rigid law of land-tenure. Though at present there has been no considerable change in this direction, a tendency has been noticed in some districts for the proprietary right in land to pass into the hands of money-lenders and capitalists, a result which would be entirely adverse to the well-being and happiness of the people generally. In favour of the capitation-tax, as we levy it, there is very little to be said. The people pay it without a murmur it is true, but the fact remains that the assessment is unjust because it presses equally on rich and poor, on the young man just starting perhaps in trade or in a farm, and on the wealthy old trader or money lender who lives close by him. If the people pay the tax readily it is because they are, generally speaking, well off or even wealthy. But I should think that its remission or conversion into some tax on consumption would be a boon to a very considerable part of the community, and those too, the poorer classes. To conciliate these, I need hardly say, would be materially to strengthen our political position in Burmah. One more point remains to be noticed in the comparison I have been making. Under our inelastic rule, not only is no exemption granted to the very poor on the ground of their poverty, and no additional demand made on the rich on the ground of their wealth and their consequent ability to contribute more largely without feeling the

burden, but there is one considerable class of persons who, to some extent, escape the taxation to which their fellows are subject—I mean those who are not engaged in agriculture but in trade. These are usually more wealthy than people of the agricultural class. They pay a capitation-tax which is a mere trifle to what people in the same position would be called upon, and justly called upon, to pay under the Burmese system as income-tax. And, except as regards the grain which they, like the cultivators, consume, the land-tax fails to reach them altogether.

II.

NOTES ON THE ELECTRICAL EXHIBITION AT PARIS.

BY

LIEUT. A. C. MACDONNELL, R. E.

The Paris Electrical Exhibition, if not a revolution, is at least its forerunner. Scientific men experiment in their laboratories, and reason in learned treatise; the public demand *results*, and judge by them alone. They have heard of wonderful theories, but they ask practically, how can they light a street, a theatre, a *salon*, and how place the best lamp on a study table? The answer is here given, so far as progress has yet been made, and the answer is admitted to be satisfactory. If not perfect, it proves that Electricity has ceased to be speculation, and has become clearly practical. Its wonders can no longer be ignored, nor crushed by vested and opposing interests. The existence of a great and newly applied power has been established, and now it only rests with the scientific and working engineers to prove its capacity for further development. This Exhibition opens a new era in the history of science, and announces the reign of Electricity by the side of that of steam; so that to-day, after Watt and Stephenson, we salute Edison, Gramme, Siemens and Bell.

To the more learned student the Exhibition does not present the opportunities which it might have done; the catalogue gives no information to him, and the different exhibitors have not taken the opportunity of announcing the special merits of their inventions; he is left to discover these for himself, with no card of particulars on each machine, and no means of ascertaining their special qualities but his own previous knowledge. Hence much may be passed over which deserves special notice. To examine the spaces filled with complicated instruments is thus an unnecessarily difficult task. This can only be done by day when there are no lights; and at night vast crowds throng the building, to be bewildered by the flood of light which pours on them like a tropical sun; but this is an admirable opportunity, never before offered, of comparing results.

The first and most important is the production of light, and almost every nation in Europe has its groups of lamps, worked on different principles, hung up in various parts of the building.

There are two distinct systems of lamps which may be briefly noticed, the first in which the light is produced by the current of Electricity passing between two carbon points in the open air, the second in which a very thin thread of carbon is heated (by the passage

of the current through it), inside a small pear-shaped glass globe, from which all the air has been extracted. This second or incandescent system is the one which attracts most attention by its beauty, and by the fact that each light is worked by its own current, independently of all other lights, though one generator may supply the Electricity to all.

As examples of this kind, we have Edison's, Swan's and Maxim's, and they seem to leave nothing more to be desired. Each has a large room lighted with the respective lamps, most tastefully hung from chandeliers in the centre; the effect is most pleasing, without the least glare or flicker, and every part thoroughly lighted. The Swan light has a decidedly yellow tinge, the Edison being whiter and perhaps more cheerful, but the difference can really only be a matter of taste; the result being that Edison's is a perfectly steady, small and soft white light, which must be admirably adapted for reading by.

Any or all these lights can be turned out or lighted at will, as easily as gas; no bad air is produced, and very trifling heat evolved, these being the faults so objectionable in gas.

Each globe is stated to last about 8 months, is of small cost, and if broken can be replaced easily by any servant.

The first system or Arc lamps give too vivid a light for small spaces as well as being liable to a constant flicker and change of colour, which, for domestic purposes, would render it unpleasant—the two latter faults are chiefly due to the difficulty of maintaining a constant current and a uniformity in the burning of the carbon points. Various resources are exhibited for overcoming these difficulties, among the most successful of which may be noticed those of the Brush Company, Gramme, Pilsen Arc Company and Weddermann. They give an almost perfectly steady white light, though even these at times show the faults that this kind of lamp is subject to. In comparing them with the incandescent lamps, their qualities of light are so different that one infers each will have its separate use—the more intense for lighting larger spaces, and the other, a softer light, more for domestic purposes. Mr. Edison has worked out his system so thoroughly for the supply of cities and towns, that samples of the actual conductors, for the Electric current to be laid in the streets, are exhibited; they consist generally of two large insulated conductors of copper in a single metal tube, one to convey the current from the main source of supply, and the other to convey it back. This constitutes the street main as in a gas supply, and from this any house can have laid into it two smaller conductors of a similar kind, and from which each light can have its separate pair of wires to supply the Electricity which raises it to incandescence. Thus it can be seen that each light is independent of the other. A similar system (as arranged by Mr. Maxim), is exhibited by the United States Electric Lighting Company, so excellently, that all visitors to the Exhibition will carry away with them the conviction that it practically solves the problem of the division of the Electric Light. It is also *un fait*

accompli, for the Jaine Company have employed over 1,500 workmen for the construction of lamps, &c., on this system, during the past year, and still have not been able to supply the demand in full. This Company illuminates the large Salle d'Honneur, on the first floor, with a number of separate lights elegantly grouped, one beside the other, which produce a charmingly soft light, the eye is agreeably impressed, and is not inconvenienced by the intermittance and irregularities which are generally so disagreeably fatiguing.

To more fully demonstrate the domestic uses of Electricity, large *salons* are furnished in different ways: we have first, a *salle du theatre*, with the scenery completely and most successfully lighted; then comes a picture gallery, the pictures of which can be enjoyed as much by the Electric Light as by daylight; the lamp used is that of Weddermann's or the *lampe soleil*, which is remarkably steady, and has been softened by thick glass globes. Colours come out admirably and the lighting is a decided success. Next comes a dining room with the table laid out and decorated as if for dinner; the light is thrown downwards, is very white, steady, and subdued by glass globes, producing an excellent effect and leaving nothing to be desired. After these come anti-chambers, a kitchen, a bath-room, all lighted with equal success; showing how the light can be subdued and softened for each special use. We have also rooms illuminated by the now familiar Jablochhoff candle, but it did not compare well with the modern lamps.

One room was remarkable for being very pleasantly lighted by a strong light being thrown on to a white ceiling and thus being diffused into the room, but it seemed to lead to an unnecessary waste.

We may now notice the various systems of generating Electricity. Speaking generally, there are two classes of generators used in practice, the Dynamo-Electric and the Magneto-Electric machines. The latter of these is but little used, as it is not economical, losing the advantage of the reflex action the others have. It is, however, exhibited with some success by Mr. Meritens, and supplies the current necessary for a large lighthouse, forming a striking centre-piece to the Exhibition building. The Dynamo machine is the principal and important form of generator, and a very large number are exhibited. Of these the Brush Machine is considered by *savants* to be the most practical in principles and results. Though the Edison Machine is said to work as well, there are no means of comparing them, the latter only sending its currents to Incandescent lamps, and the former only to Arc lamps.

There are many technical details in the Brush Machine, such as the heating of the armature, sparking, &c., which did not appear so well eradicated in any of the French or English machines (except in the Edison above mentioned). The difference, however, between these machines is chiefly of a mechanical nature; and, no doubt, the activity and impetus given to Electricians and inventors by the sudden demand for Generators which has arisen, will continue to improve the many details which belong to each machine. Edison, however, claims

special notice in the construction of his Dynamo-Electric Disc Machine, as being on a somewhat new principle; he sub-divides the armature, and insulates it and the conductors by plates of mica, thus enabling him to produce most *intense* currents without fear of heating the machine or compromising its insulation. We next come to conductors, of which there are examples from all nations. The English exhibit a system of conductors placed in a tube with ordinary packing between each wire; the tube is then filled with a good mineral oil, which acts as a non-conductor, and the whole can then be used as a cable under ground or under water; they claim as its advantage that it is much cheaper than the regular cable with india rubber insulation, &c., and eradicates "Interference."

To complete the apparatus necessary for Domestic lighting, the Generator, the Conductor, and the Lamp, Mr. Edison adds a contrivance for measuring the consumption of Electricity in each house, which is meant to take the place of the present Gasometer: this is done by permitting a certain known fraction of the whole current flowing into the house always to produce a deposit of copper in an Electrolytic cell; when this is weighed, the total quantity of current which has traversed the circuit can be calculated by well known laws. Apparatus devoted to Electrical measurements are very numerous, though little used practically in the Exhibition, but those by Sir W. Thompson and Mr. Edison are full of the deepest interest for the Electrician.

To set the Generators in action we only require a circular motion, and this may be obtained in the various ways already known to Machinists; the power mostly used in the Exhibition is that of Steam, with endless bands of Leather, Cotton, Steel or India-rubber for transferring the motion to parallel axes. Cotton bands seemed to be a somewhat novel idea, and worked excellently, though the Steel was also considered good, but the India Rubber was constantly slipping, owing to oil or grease getting on it. Gas is a most important motive power. Both French and English exhibit Gas Engines, giving from 4 to 10 Horse power, and working a Dynamo Machine economically and successfully, using ordinary coal gas. To add still more to the importance of this motor the English exhibit an apparatus for making cheap gas suitable for engines, which can drive Dynamo and other Machines still more economically. The total cost of this gas is said to be $\frac{1}{2}$ or $\frac{2}{3}$ cheaper than the ordinary gas. Wherever there exists any natural motive power, such as can be obtained from rivers, tides, wind, &c., the expense of generating Electricity must fall to a minimum; and although Sir W. Thompson stated at a meeting of the British Association this year, that as yet it was not found economical to produce Electricity by wind, there is no doubt the time is not far distant when it will be made so; the principal reason against it now is its inconstancy, and this is at once surmounted should the question of *Storage* of Electricity be practically solved. We have in Mr. Faure's Battery the successful solution of the principle, and for many purposes a practical solution.

The storage of Electricity is no doubt still in its infancy, but all will agree in saying that it is certainly the most important contribution

(in principle) now in the Palais de l'Industrie—Mr. Faure has designed a battery, called by him a secondary battery, which is charged slowly by a weak current from any source, say a small Dynamo machine, or an ordinary Voltaic battery; it remains so charged for a very long time without deteriorating and can then be used for almost all purposes. All kinds of lamps, both Arc and Incandescent, when so supplied burn with a remarkably steady glow, particularly the Arc lamp, without its usual flickering.

The effects thus produced are equal in all respects to those from a Dynamo machine, and the charging can be carried on from a distance; this would be the case in towns where each house might be provided with these stores for Electricity, charged by day from a Central Generating Station, and ready by night to supply the demands for domestic purposes.

The battery depends chiefly on the decomposition by the charging current of gases in the battery itself, which gases, in turn, reproduce the Electric current. It has, as yet, been found necessary to have the plates of the battery made of lead, which give rise to the serious objection of great weight. It seems, however, no distant step in the present day to the discovery of a lighter material, equally as good for the same purpose, and which discovery ought to open new and even larger fields for the use of Electricity on Locomotives, than we have thought of as yet.

We next come to the production of motion by Electricity; but here we have little new to record, except in the improved manufacture of motors, in their economy of power, and their application to innumerable uses. In a general way we know that a revolving magnet can produce an Electric current, as for instance, in the Magneto Electric Machine, we can, therefore, understand that the reverse might be true, and that if a current of Electricity be properly arranged it might turn a wheel. Such is the case, and it is thus that any kind of machine can be worked by an Electric current. Once a force produces a circular motion, its application is only a question of practical mechanics. There are a great variety of examples in the exhibition of machines worked by Electricity, such as pumps, sewing machines, &c., &c., all of which are a mechanical success; but the most attractive to the public in this line is the Electric Railway. The wheels of a large omnibus are made to rotate by a current of Electricity, and so propel the omnibus along a tramway at about six or eight miles an hour, carrying passengers to and from the Exhibition building. In this case the Electricity is conducted to the machinery under the omnibus by two wires suspended in the air on poles (close to the side of the tramway) on which short *leads* to the omnibus slide along. Elsewhere the Electricity has been conducted along the rails themselves.

This can hardly be said as yet to be a very practical system of locomotion, particularly as the current has to be conveyed to the moving train from a stationary engine or generator.

Whenever the train can be made to conveniently carry within it its own source of supply, we shall then gaze at Siemen's present Electrical

Locomotive, as we now do at the first steam engine in the British Museum !

We next come to the production of Sound and its applications. Telephones of every description are there, each nation vying to produce the most effective. There is nothing absolutely new in this line, except in Edison's collection, to be hereafter noticed. The French exhibit a great number, in which they combine Transmitters and Receivers invented by other nations. A considerable number of instruments are placed at the disposal of the public, all connected with a central office, where there is constantly an indefatigable person in readiness to converse with the various stations.

But the most famous and attractive application of the Telephone is the successful connection of the building with the Grand Opera, and with the Comédie Française. The visitor is ushered into a tranquil room, a Telephone placed to each ear, and the singing and orchestra are thus distinctly heard. More than this, as the singers move to the right of the stage, the Telephone at the right ear sounds louder than the other, and should they move to the left the reverse occurs. This is effected by using two receivers, one on each side of the stage, and the Telephone to be placed on each ear, is connected with the receiver placed on the corresponding side of the stage.

All Telephones require to be placed close to the ear, except Edison's *Loud-speaking Telephone*, and nearly all require the aid of a small battery, except the Gower Bell Company's, and Siemen's of London, who both exhibit a Telephone which, for practical use, has the advantage of requiring nothing but the wire which connects the two stations. A small reed is placed close to the plate of the Telephone, and when this is blown the musical note so produced, like that of a small trumpet, is readily picked up by the Telephone and conveyed to the receiving Telephone which in its turn reproduces the musical note distinctly enough to be heard all over a room : thus by blowing the reed, we call the attention of any one at other end and commence a conversation without the usual system of a battery and Call Bell.

We should mention an instrument in the French department, showing how the rapid interruption of a beam of light produces similar vibrations in a Telephone, capable of being listened to. This illustrates the great principle of the "Photophone"; and it is astonishing that no specimen of that wonderful invention is here exhibited. By it, the vibrations of the voice striking on a Selenium mirror cause vibrations in the beam of light, which in turn put in similar vibration a plate of Selenium at a distant station, and a Telephone placed in connection with this latter enables the observer there to hear what has been spoken at the first station, without any communication by wire between the two stations. The beam of light takes the place of the wire.

Another important omission is that of the system by which a crucible of carbon may be heated by a current of Electricity sufficiently to smelt or fuse metals. Probably no practical use has yet been made of this, but the idea contains future possibilities.

Amongst the most important of the many applications, are those for Telegraphic signalling, and novel forms for railway instruments. The French have given peculiar attention to this branch ; it is shown how their signals and railway points are worked by Electricity, and the passage of trains indicated automatically. The Americans show a "Lock and Block" system of great simplicity for a double line, which they say would make accidents impossible. Electricity locks the signal at the next station till the proper moment for a train to pass. The system seems most practicable, and has been strongly recommended by the inspectors of the English Board of Trade.

Relays, Keys, Duplex and Quadruple, Printing and other Telegraphic apparatus, are all to be seen at work. Amongst them a novel French system, announced as "permettant l'échange simultané de plusieurs dépêches par un même fil."

Another ingenious exhibit shows how six messages may be sent along one wire at the same time, by having six tuning forks of different pitches at one station, and six of similar pitches at the other ; the arrangements are such that the tuning forks are made to vibrate, and each to sing its particular note. When any particular fork is stopped at one end, it is only the fork of the same pitch that will be stopped at the other, in accordance with a well-known acoustic law ; and by these interruptions a message is sent to that particular station ; while messages sent through the other forks do not interfere with that.

The Americans exhibit their very complete arrangement for Telephone Exchange, in which the wires from all parts lead into one huge board, so arranged that any station can be put in connection with any other by simply inserting a small conducting pin. This has been for some time in general use in New York and elsewhere. They also show a superior *Visual Indicator*, by which signals are transmitted instantaneously on a single line to any number of other stations, and this may be applied to all forms of Telegraphic signals.

A clever arrangement gives warning in case the light is extinguished in the signal lamps. The flame expands a spiral over it by its heat, and so making contact between two metal points, allows a current to pass, which keeps a bell ringing. As soon as the light is extinguished, the spiral spring cools and, by contracting, breaks the circuit, when the bell ceases to ring, and thus warns the signal man.

The Germans have a curious device for measuring ranges, by means of two stations placed at an interval of about fifty yards, and connected by loose wires to a central station. Pointers are then directed on a distant object at each of the two stations, and every movement of these pointers is communicated electrically to similar ones on a board, with the distance of the pointers represented on a smaller scale, so that the place on the board to which they point, when measured, will give, according to the scale, the actual range of the distant object.

Fire Alarums are numerous. The French use a thermometer, and when the mercury rises in consequence of fire beyond a certain

point, it makes contact with a wire in the upper part of the tube, which causes a current to pass and ring a bell at any desired station. The English have adopted a system of post, or wall boxes, not unlike those for letters, with a small glass protecting the front. This can be broken in case of a fire near, and the Electric Bell pressed for the Fire Brigade Stations, where an indicator shows the locality of the post.

The Belgians show how rock borers may be worked in mines or tunnels, the generator being at some distance from the mine, and the wires offering great facilities for movement.

A miniature Electrical Railway should not be forgotten—used for sending packets and letters underground, the whole fitting into a tube of about a foot in diameter.

The instruments for Electrical Measurements, although their working could not be publicly exhibited, are none the less important. Some of the French instruments for measuring short spaces of time, by the interruptions of different currents, are finished works of art.

As regards Compasses, the English and Dutch both exhibit good specimens, but that of Sir W. Thompson shows a great and most important improvement in this line. It has been practically tested in both hemispheres, and found to work with small deviation even in the Southern hemisphere. This is an advance whose value can be fully realised only by those on whom falls the responsibility of guiding large ships to all parts of the world.

For agricultural or building purposes, where night work is often essential, there are exhibited several moveable engines which produce the Electric light by a generator and its accessories, all carried by it in a convenient way. The lamp is raised on a pole about 40 feet high, fixed and stayed to the locomotive, so that the whole means of producing light can be readily moved to any required spot.

The application of Electricity for military purposes opens a wide field, particularly in its use for torpedoes and submarine mines; but as each nation is inclined to divulge its own inventions as little as possible to others, we are much disappointed in this department, as nothing is to be seen that is not already known. The Dutch expose a large submarine mine, and the English and Russian show some interesting contrivances for exploding, on the mine being struck by a ship.

The French use Electricity for the measurement of the velocity of a cannon ball or rifle bullet, from the time of explosion to the time of its leaving the muzzle, and the velocity of recoil of a gun. Their large reflector, with an Electric light in the focus, for sending signals to very distant stations at night, is one of the most complete exhibited. The signals are made by obscuration of the light for certain intervals of time, which are so varied as to represent letters or symbols.

Most of the nations exhibit their different waggons for laying a field telegraph with everything complete. The Swedish waggon for

carrying the wire was very neatly arranged; the American poles for an air line were remarkably high, and the waggons for carrying them seemed, therefore, to be of an extreme length.

The French showed a locomotive with all requisites for producing the light, and a reflector to throw it where required.

A special reference is due to the Edison exhibits, which are both wonderful and numerous, and which contain so many new principles and ideas, that they could not be classed with those of almost any other inventor.

We have already spoken in praise of his light, and explained that it is produced by a piece of carbon, like a thin wire, incandescent in a vacuum. The more it is examined the more it will be liked.

Besides the pendent lustres decked with numerous small lights, a single and separate lamp stands on a table, with a beautiful soft steady light, suited for reading by. It is small and moveable, and can be extinguished and re-lit at will, produces scarcely any heat and does not burn the good air of a room. For the Study and domestic use these advantages are enormous.

Edison's system of Quadruplex Telegraphy is shown at work, by which four messages are sent along the same wire, at the same time, without confusion of the different letters and words.

It is interesting to see the different forms of Telephones which Edison invented successively, before arriving at his present one. His *Loud Speaking Telephone* permits of the voice from the distant station being heard all over the room, but with the slight inconvenience that a small handle is kept turning while the answer is being received. It is doubtful whether this would supersede practically that which one puts to the ear.

His Micro-termomètre is an apparatus by which the most subtle difference of temperature can be observed; and it has proved so sensitive as to distinguish the difference in the heat produced by the luminous rays of various stars.

His Telephonograph is well known by frequent exhibition to the public, and is here one of the most popular attractions. The voice produces vibrations as in the ordinary telephone plate, these indent a surface of tin foil which revolves on a cylinder; so that when the process is reversed, these indentments can re-produce the exact vibrations by which they were formed, and so the voice can be heard by a numerous audience with its special peculiarities, by simply turning the cylinder; and this may be repeated at any distance of time.

The Autographic Telegraph is a beautiful invention, by which the writing or drawing placed on a revolving drum at one end, is produced in fac-simile on a paper at the other station. Another important practical invention is that by which messages may be transmitted by weak currents, even when too feeble to have any effect on an Electro Magnet.

No part of the exhibition better illustrates how docile and manageable is this great force. A touch on a spring makes it accomplish mighty work, in obedience to man's varied commands ; yet no reflection is more forced on the mind by this exhibition, than that applied Electricity is still only in its infancy. It is but an infant, but an infant Hercules !

III.

A PROPOSAL FOR THE RE-ORGANIZATION OF THE
ROYAL ARTILLERY,

BY

T. R. DISNEY, MAJOR R. A.

Within the last 5 years the Royal Artillery has been twice re-organized. In 1877 the old brigades, in which there was a certain amount of cohesion, were exchanged for larger ones which were scarcely more than brigades in name; while the recent re-organization leaves to the brigades the name only, there being no longer even the semblance of a Commanding Officer, and the only connection between the batteries being that they are recruited from the same group of territorial divisions. As, however, it is a pure accident when 2 batteries of the same brigade are quartered together, this connection will at once be seen to have no practical importance, and the regiment, as at present constituted, may be taken to consist of so many batteries of Horse, Field, and Garrison Artillery, whose only real point of connection with one another is the Head Quarters Office at Horse Guards. These batteries are scattered over the face of the earth, in some instances singly in others in twos or threes or larger numbers. When a battery is alone it is commanded by its Major, but when two or more batteries are together, to whatever branch they may belong, the senior officer of Artillery is the Commanding Officer in the acceptance of the term as defined in the Army Act: unless where a considerable number of batteries are quartered together and divided into groups of two or more, each group constituting the command of a Lieutenant Colonel, who exercises the full powers of a Regimental Commanding Officer, but is at the same time subordinate to the senior officer of Artillery on the spot, who, except in rare instances, has himself no greater disciplinary powers, but through whom alone, can any communication be held with superior officers on the staff of the Army. In all cases, except when their batteries are serving alone, Majors of batteries have only the disciplinary powers accorded to Officers Commanding Troops and Companies of the other arms. Again—the Lieutenant Colonels, being for the most part Commanding Officers, are localized, remaining for 5 years at one station, during which period many different batteries may pass under their command each for periods varying from a few months to 3 or 4 years.

Although when serving under any superior officer the disciplinary powers of officers commanding batteries are thus curtailed, each battery is in itself a separate unit as regards interior economy, the Major assisted by a Non-Commissioned Staff performing all duties

connected with pay, clothing and equipment, and corresponding direct on such subjects with the different departments of the Army and appointing his own Non-Commissioned Officers up to the rank of Staff Sergeant, subject to the merely nominal approval of the Commanding Officer for the time being.

In the Horse and Field Artillery also, the battery, which on a war footing consists of 6 guns, is the recognized tactical unit.

At the Head Quarters of every district is an officer, generally a Colonel, termed the Officer Commanding Royal Artillery in the District; this officer is considered to belong to the Staff of the General Officer Commanding, but is, at the same time, to a great extent in the position of a Regimental Commanding Officer, than whom, in most instances, he has no greater powers, while as a staff officer he holds no communication with the Officers Commanding Troops under whom his batteries may be serving, but corresponds through his own staff direct with the Officers Commanding Royal Artillery at each station.

Again, although the Non-Commissioned Officers and men of each battery are a distinct body, the officers of all branches of the regiment are on one list for promotion, (there are practically 4 lists but the cadres of the late Indian Artillery are worked on the same system) so that, supposing a Captain, say of Garrison Artillery, who may have put in the whole of his service in that branch, to head the list, and a vacancy to occur in a battery of Field Artillery, this officer is promoted to the command with as much knowledge of his work as an officer of Infantry would have if promoted to the command of a cavalry regiment. The Horse Artillery is officered by selections from the other branches, and, as a rule, no officer is appointed in a higher rank who has not served in the rank below, so that it is not subjected to any such contingencies as the foregoing, but the very fact of such selection being the rule causes a constant changing of officers, it being a not unusual occurrence to see four out of five officers removed from a battery by promotion in a single year: and, of course, the selections for Horse Artillery cause corresponding changes among the officers of batteries of Field and Garrison Artillery.

In fact the Officers of Artillery are perpetually on the move, and what with promotions, transfers, exchanges, appointments to Horse Artillery, and changes of station, batteries of all branches suffer from a continual change of Officers, and more especially of Commanding Officers.

Further, the system of *imperium in imperio* which obtains in the Royal Artillery—the Colonel commanding in the district, the Lieutenant Colonel commanding at the station, perhaps another Lieutenant Colonel under him commanding the division, and finally, the Major commanding the battery—causes an infinity of trouble and paper work, as may easily be imagined, when it is considered through how many channels every communication has to pass before it can reach the General Officer Commanding, none of the intervening officers having, in nine cases out of ten, any power of settling the matter. It also doubtless causes a division of responsibility, for no officer can be

thoroughly responsible for the efficiency of his battery if he is not responsible for its discipline, and it has been shewn that the discipline is in the hands of the Commanding Officer for the time being, and not in those of the Major of the battery.

Suppose that a number of Officers of Cavalry and Infantry were placed upon the same list for promotion, and appointed indiscriminately to the command of squadrons, and double companies: that the squadrons and double companies were scattered about like batteries, commanded one day by a cavalry and another by an infantry Lieutenant Colonel, with a superior officer of one arm or the other at the Head Quarters of each District to command the whole—can any one think for a moment that such a system would answer, yet this would be something very like the present Artillery system.

It is no answer to point to the well known efficiency of some batteries; they are efficient in spite of and not because of the system, which nothing saves from failure but the tact and discretion of the officers who have to administer it, and such qualities under a better system would doubtless produce greater results.

With this short review of the system as it exists, I will proceed to sketch briefly the changes which I venture to advocate, and which are:—

1. The separation of Horse, Field, and Garrison Artillery—and I shall confine my further remarks to the future of the two former branches.

2. All batteries of Horse and Field Artillery to be increased to 8 guns, and to become the administrative as well as the tactical units, the command of the battery being the highest—so to speak—regimental command. Three or more batteries, when brigaded together, to constitute the command of a Colonel on the Staff or Brigadier General, and be on the same footing as a brigade of cavalry or infantry.

Each battery to be divided into 2 troops under the command of a Captain or Major, the whole being commanded by a Major or Lieutenant Colonel with a Captain or Subaltern as Adjutant. The Officers Commanding Troops to pay them and be responsible for their efficiency to the Commanding Officer in the same manner as the Major or Captains of Troops and Companies in the other Arms.

The full complement of gunners, horses and wagons need only be kept up in the 1st Army Corps and in India. Non-Commissioned Officers and drivers to be always kept up. A certain proportion of gunners in the Field Artillery to be taught to ride, and mounted, when necessary, on the off horses.

There are at present 26 batteries of Horse Artillery, exclusive of the Dépôt, and 79 batteries of Field Artillery, giving a total on a war footing of 156 guns of horse and 474 guns of Field Artillery, or 630 guns in all; of these 10 batteries of horse or 60 guns, and 41 batteries of Field or 240 guns, are abroad, and the remainder at home, *viz*:—96 guns of horse and 228 of Field, or a total of 324 guns; and as 90 guns are required for an army corps under the mobilization scheme, we have at home guns for only about $3\frac{1}{2}$ Army Corps, with no power of increase except by raising new batteries, for all the batteries at home have been

reckoned above as on a war footing of 6 guns, while in fact the greater number of batteries of horse, and some of the Field batteries, have only 4 guns each.

The first and ordinary requirement from the batteries at home is to provide for the relief of those abroad: the second to furnish guns for the several Army Corps in case of a European War—the latter is exceptional; it would be impossible, having consideration to expense, to keep up the necessary establishments in time of peace, and the batteries should, therefore, be capable of expansion under special circumstances. A proposal to meet such circumstances will be found further on; but first as regards relief.

The requirements of India in regard to Horse and Field Artillery have recently been fixed, and the only other place where Field Artillery is at present employed is Natal, where there is only one battery. We may, therefore, take the guns abroad as they now stand (June Distribution List) as a constant quantity, *viz*:—as above stated, 60 guns of Horse, and 246 of Field Artillery; and in order to assimilate these numbers to the 8 gun system, it is proposed to increase them to 64 and 248 respectively, which will give us 8 batteries of Horse and 31 of Field Artillery abroad, for the relief of which a similar number of guns at home will be required.

Now as regards the requirements of the several Army Corps in case of a European War. It is proposed that, if it should become necessary to increase the Artillery temporarily under such circumstances, it should be done by adding a troop (4 guns) to the batteries required for service. A reserve of Artillery officers should be formed who could be utilized in such case to some extent; the reserves, and dépôts (to be hereafter mentioned) would supply the men, and horses must be obtained from the batteries last for service, who would receive remounts in lieu: while the officer commanding the battery would arrange for the transfer of a proportion of trained Officers, Non-Commissioned Officers and men to the new troop.

By this means the 64 guns of horse and 248 of Field Artillery, kept up at home for the relief of batteries abroad, would be capable, in case of emergency, of expansion to 96 guns of horse and 372 of Field Artillery, in batteries of 12 guns each, or a total of 468 guns, that is, at the present rate of guns to troops, Artillery for rather more than 5, instead of $3\frac{1}{2}$ army corps; the proportion of Horse Artillery would be smaller than at present laid down, 3 batteries of Horse and 2 of Field Artillery being told off to the Corps Artillery in the mobilization scheme, but it is thought that no disadvantage would arise from substituting Field for some of the Horse Artillery now told off for the above purpose, more especially if the former branch were rendered more mobile as already proposed. The allotment of Artillery to the different parts of the army corps, would also require re-arrangement, the batteries being of 12 guns each instead of 6, possibly 7 batteries to each army corps, 84 guns instead of 90, would be found sufficient, 2 of horse, and 5 of Field Artillery, 1 battery of Horse Artillery with the cavalry brigade and 1 with the corps artillery, and 1 battery of Field Artillery with each Division, and 2 with the corps Artillery.

We should thus require in time of peace 16 batteries of Horse and 62 of Field Artillery of 8 guns each: and it is proposed to divide these into 2 regiments of Horse and 6 of Field Artillery: the former to consist of 8 batteries each, and the latter to consist of 5 regiments of 10 batteries, and 1 of 12.

It is far from my intention to say, that it would not be desirable to maintain a larger force of Artillery: the peace establishment of Artillery should be formed, so that when placed on a war footing, it would furnish a sufficient number of guns for the largest force the country is prepared to place in the field: but my present scheme has only in view the making the most of such a force as at present exists, without, if possible, causing additional expense. I do not think that any establishment maintained in peace could be increased in time of war in a larger proportion than is proposed, and it will be seen, that the present scheme gives us, on a war footing, 468 guns instead of 324 or a gain of 144 guns.

A separate depôt to be formed for, and a superior officer, Colonel on the Staff or Brigadier-General, appointed to the command of each regiment; the Head Quarters and depôt to be localized.

The Officer Commanding the Depôt to be assisted by an Adjutant and Quarter Master; the Officer Commanding the Regiment by a Brigade Major and Pay Master; the latter to pay all batteries of the regiments at home. The original attestations to be kept at Regimental Head Quarters, where all work now done for the Regiment at large in the Record Office at Woolwich, would be performed. The officer commanding the regiment arranging for such transfers as might be necessary between the Depôt and service batteries and for the drafts for the batteries abroad. At each Head Quarters there should, if possible, be accommodation for two or three batteries of the regiment, in addition to the Depôt, these being brigaded together under the officer commanding the Regiment: batteries at home going to Head Quarters in turn.

Men to enlist for a particular regiment, and not to be liable to transfer to another, without their own consent.

The change as regards officers to be made gradually, and it is proposed that it should be done something in this way, and be the first step in the introduction of the new scheme.

Every officer in the regiment should be called upon to state in what branch he is desirous of serving for the future, and the wishes of each officer having been considered as far as possible, with due regard to the period of his service in the several branches, and the reports made upon him while serving in them, 3 lists of officers, of Horse, Field, and Garrison Artillery respectively, should be formed and the result published. A certain time should then be given within which officers should be permitted to exchange from one list to the other without loss of standing, at the expiration of which the lists should be finally separated.

The officers of Horse and Field Artillery should next be divided into the three grades of Battery Commanding Officer, Troop Commander, and Subaltern, in accordance with seniority on the lists, but without reference to rank (*vide the next para.*); they should then be posted to the new regiments in their several grades, the senior becoming senior battery commanding officer in the 1st regiment, the second senior battery commanding officer in the second, and so on.

The batteries could then be re-organized on the 8 gun system, and ten new regiments regularly formed.

By introducing the scheme gradually, in some such manner, it is thought that very little hardship would be entailed on individual officers. It would also probably be found, that if the advantages as to promotion, &c., come pretty equal in the several branches, there would not be so much competition for Horse and Field Artillery as might perhaps be expected, but that officers would, of their own accord, select the branches for which they were most fitted, and with which they were most familiar.

The present competition for Horse Artillery among officers of the other branches, caused not only by the desirability of that service in itself, but by appointments to it being considered as a recognition of the efficiency of the officers appointed, while undoubtedly advantageous to the former branch, is not equally so to the Field and Garrison Artillery: one result is the large proportion of very young subalterns in the two latter branches: the senior subalterns of some batteries having only two or three years service, and these may be called on at any time to take command of their batteries. Many officers of all ranks of garrison artillery are constantly looking forward to leaving that branch for the Field Artillery, and of both Field and Garrison to appointments to Horse Artillery; and although efficiency in the branch they are serving in is a necessary qualification for transfer to the others, it must be remembered, that when subalterns are so transferred, they are replaced, not by efficient officers, but by young officers who have to be taught their work.

But, if the branches were once separated, there can be no reason why one or other should not be selected as a permanency, just as at present, the cavalry or infantry, is selected by candidates for appointment to the other arms; no doubt each branch has its own peculiar advantages for officers of different tastes, acquirements and means, and all, once permanently settled, would be able to take an equal pride in their several branches.

4. The number of batteries of each branch having been fixed, it will next be necessary to fix the establishment of officers: and it is proposed that the numbers of each of the higher ranks should bear the same relative proportion to the number of subalterns, as in the cavalry and infantry; all employed officers being seconded and shewn in *italics*. As rank and command have been dis-associated in the other arms, there can be no reason for retaining the connection in the Artillery. The proportion of each rank, therefore, having been fixed, so as to ensure,

as far as possible, that the average rate of promotion in the Artillery shall not be less than that in the other arms, the list should be again subdivided into Battery Commanding Officers, Troop Commanders, and Subalterns, the numbers of the latter, as above stated, forming the basis of the calculation: so that a Subaltern when promoted would of necessity become a Troop Commander, but a Captain promoted to Major would retain the command of his troop until a vacancy occurred among the battery Commanding Officers; while a Major, being a Commanding Officer, on promotion to Lieutenant Colonel, would still retain command of his battery.

In the Cavalry and Infantry, the proportions of the different ranks are as under, *viz*:—

			CAVALRY.	INFANTRY.
Lieutenant-Colonels	...	...	2	4
Majors	...	...	3	8
Captains	...	...	4	10
Subalterns	...	...	12	30

and the following are the proportions proposed for one of the new regiments of Artillery of 10 batteries*, which for 80 guns would require 40 Subalterns, *viz*:—

Lieutenant-Colonels	...	...	6	10
Majors	...	...	11	20
Captains	...	...	13	20
Subalterns	...	...	40	60

Of these, 6 Lieutenant Colonels and 4 Majors would be battery Commanding officers, and 7 Majors and 13 Captains, Troop Commanders: Brigade Majors, Adjutants, &c., being supernumeraries.

After 4 years as Lieutenant Colonel in command of a battery, every officer to retire on pension, or be placed on half pay to await higher employment.

5. The appointment of Officer Commanding Royal Artillery at the Head Quarters of each District to be abolished: in his place an officer of Artillery, of suitable rank, to be placed on the staff of each General Officer, who, while available for General Staff duties, would be the adviser of the General Officer on Artillery matters; all communications to batteries from this officer to pass through the same channels as similar communications to Officers Commanding regiments and battalions of the other arms. Brigades of Artillery to be formed at certain stations, *vide paras 2 and 3*, on the same footing as Brigades of the other arms. General officers, or officers who have retired on half pay after commanding batteries, to be eligible for such commands.

* For Establishment of Officers for Regiments of 8 and 10 guns, *vide table A.*

6. In addition to the commands of Brigades and Regiments already referred to, a certain number of staff appointments to be reserved for officers who shall retire on half pay from the command of batteries. General and other officers of Artillery to have their fair share of army staff appointments.

7. The D. A. G's. office at Horse Guards to be relieved from all supervision with regard to discipline, and matters not special to Artillery; correspondence on such subjects passing through the same channels, and being disposed of in the same manner as in the rest of the army.

8. Inspector Generals to be appointed for Horse and Field Artillery, at home and in India; duties as at present, similar to those of Inspector General of Cavalry.

9. A regular system of gunnery, on the same principle as rifle instruction, to be introduced. A trained gunnery Sergeant to be appointed to the staff of each battery, and Inspectors of gunnery appointed for specified districts to ensure the system being properly carried out.

10. Provision to be made for the promotion from the ranks of a small number Non-Commissioned Officers, in order that the ranks of the Artillery may not be completely closed to men of ambition. A proportion of commissions in the Coast Brigade being also reserved for Non-Commissioned Officers of Horse and Field Artillery. The Sergeant Major of each battery to be a Warrant Officer.

11. Exchanges between officers of different regiments as in the rest of the army.

12. The foregoing is but a crude sketch, but for an organization of such lines as therein indicated, are claimed the following advantages, *viz* :—

- (a) Decentralization.
- (b) A closer union between officers and men.
- (c) Assimilation to the other branches of the service.
- (d) Every officer would have his own specific work instead of, as at present, when the Captains and many of the Lieutenant Colonels are but fifth wheels to the coach.
- (e) Owing to the better subdivision of duties, the officers commanding batteries would have plenty of time for the higher work connected with their batteries.
- (f) The undivided responsibility of the officer commanding for the condition of his battery.
- (g) A great saving to the country in travelling expenses as there would be far fewer changes among the officers.

The number of guns for a battery has been fixed at 8, because that is probably the largest number, (at any rate the greatest multiple of 4, (a Captains or Major's command) which could as a rule be kept together in quarters. A battery of 8 guns could probably be accommodated wherever a battery of 6 is now quartered.

The annexed tables A and B shew respectively, the number of officers required under the present and proposed organizations, and the comparative cost of the establishments of officers at home. From the latter it will be seen that the total daily cost in pay of officers at home under the present system is £172-18-6; under the proposed it would be only £168-14-10; that the daily cost of the officers of Horse Artillery under the present system, which gives us a war establishment of 96 guns, is £59-8-6, of the same under the proposed system, giving an equal number of guns when on war establishment, only £55-2-10; that the daily cost of the officers of Field Artillery under the present system which gives us a war establishment of 228 guns is £113-10-0 or 9s. 11½. per gun, and of the same under the proposed system, giving us a war establishment of 372 guns is £165-16-1, or 8s. 10-9d. per gun. The general cost of working the new system, the batteries being independent administrative units, should be less than at present, no more men or horses need be kept up in peace time, and there being fewer batteries there would be a certain amount of saving in the Non-Commissioned Staff, &c. The system proposed for Depôt and Commanding Officers of regiments is susceptible of alteration: if it should prove too expensive, two regiments might be brigaded together, and the depôts, &c., established for Brigades instead of for Regiments: but the lists of officers for promotion should not be larger than is proposed for the new regiments, as otherwise the rate of promotion would tend, as at present, to a dead level, slower than that of fortunate regiments in the other arms, although quicker than that in others: while by keeping the lists comparatively small, officers of artillery would have something of an equal chance with officers of the others arms, of rapid regimental promotion.

SIMLA, }
 31st July 1882. }

A.
Table shewing number of Officers required for Regimental duties with the service batteries of Horse and Field Artillery under the existing and proposed organizations respectively.

		Lt.-Cols.	Majors.	Captains.	Subalterns.	Adjutants.	TOTAL.	REMARKS.
Present organization giving, on a war footing, 156 guns of horse artillery and 474 of Field Artillery.	Horse Artillery,	13	26	26	78	5	143	The Adjutants are included among the Subaltern officers & are not added with the total. The numbers are taken from the June Distribution List.
	Field "	33	79	79	237	12	428	
	TOTAL,	46	105	105	315	17	571	
Proposed organization giving, on a war footing, 160 guns of horse and 620 of Field Artillery.	<i>Horse Artillery.</i> 2 Regts. of 8 batteries each.	10	18	20	64	16	128	The increase in the numbers of officers is due to the addition of an Adjutant to each battery.
	<i>Field Artillery.</i> 5 Regts. of 10 batteries each.	30	55	65	200	50	400	
	1 Regiment of 12 batteries	8	12	16	48	12	96	
	TOTAL,	48	85	101	312	78	624	

B.

Table shewing comparative daily cost of establishment of Officers at home under present and proposed organizations.

Present Organization.

			£.	s.	d.
Horse Arty. 16 batteries giving on a war footing 96 guns.	8 Lieut.-Colonels	@ £ 1 7 0*	10	16	0
	16 Majors	@	18	6	0
	16 Captains	@	15	0	0
	48 Subalterns	@	8	10	0
	5 Adjutants	@	2	6	0

Total for peace or war establishment, £59 8 6

Field Arty. 38 batteries giving on a war footing 228 guns.	21 Lieut.-Colonels	@ £ 1 1 0*	22	1	0
	38 Majors	@	30	8	0
	38 Captains	@	22	2	0
	114 Subltrs. { 90 say,	@	30	15	0
	24	@	6	14	0
	12 Adjutants	@	1	10	0

Total for peace or war establishment, £113 10 0

GRAND TOTAL, £172 18 6

Proposed Organization.

Horse Arty. 8 batteries giving on a war footing 96 guns.	5 Lt.-Cols. Comdg. batteries	@ £1 6 0†	6	10	0
	3 Majors	@ 1 0 6†	3	1	6
	6 " Troop Commdrs	@	17	0	0
	10 Captains "	@	15	0	8
	32 Subalterns	@	8	10	8
	8 Adjutants { 4 Captains	@	17	6	0
	4 Subalterns	@	11	4	4

Total for peace establishment, £42 1 6

Add for War Establishment,

8 Captains @ 15s. = £6-0-0, and 16 Subal-
terns @ 8s. 10d. = £7-1-4 ... 13 1 4

Total for war establishment, £55 2 10

* Including 3 shillings per diem Command allowance.

† Including 2 shillings Command allowance.

TABLE B.—(continued)

Proposed Organization.—(continued.)

Field Arty. 31 batteries giving on a war footing 372 guns.	19 Lt.-Cols. Comdg. batties.	@	£1	0	0†	19	0	0
	12 Majors	"	@	18	0†	10	16	0
	22 " Troops Commanders	@	13	7	14	18	10	
	40 Capts. "	"	@	11	7	23	3	4
	124 Subltrs. {	96 say	@	6	10	32	16	0
		28 "	@	5	7	7	16	4
	31 Adjutants {	16 Captains	@	14	1	11	5	4
		15 Subltrs.	@	9	2	6	17	6
	Total for peace establishment				£126	13	4	
	<hr/>							
Add for War Establishment,								
31 Captains @ 11s. 7d.=£17-19-1, and 62								
Subalterns @ 6s. 10d.=£21-3-8 ... 39 2 9								
Total for war establishment,				£165	16	1		
<hr/>								
GRAND TOTAL PEACE ESTABLISHMENT,				£168	14	10		
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GRAND TOTAL WAR ESTABLISHMENT,				£220	18	11		
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† Including 2 shillings Command allowance.

IV.

THE NORTH WEST FRONTIER.

Text of a lecture delivered at the Rooms of the United Service Institution of India, on the 2nd August, 1882,

BY

MAJOR T. H. HOLDICH, R.E.

While the whole of India is gradually being included in one fairly complete system of military mapping, there is one part of the empire which will always be of more than usual interest to map-makers, and will always demand special attention, partly from the difficulties attending its exploration, and partly from the fact that it is on this line—the line of our Frontier—that topographical knowledge will be most immediately useful in aid of Military Science.

Much of the future history of India, as of the past, will derive its action from scenes laid far beyond the line of those frontier hills; and though we may not ourselves be concerned to take any immediate share in its action, it is on those hills, at any rate, that we shall often have to watch for the first shadow of coming events—the first indications of approaching trouble. But while there are many good reasons, which every military man will recognise without further explanation, why we should make ourselves intimately well acquainted with the topography of the frontier, and of as much lying beyond it as we can reach, there have always been many others, equally cogent and chiefly political, for leaving the frontier alone, as far as possible, while we remain in ignorance even of the exact nature of those numerous entrances and exits which intersect the border and connect India with the great plateau of Central Asia. It is hardly necessary to enter far into this subject, depending chiefly on the well known characteristics of the frontier tribes; their bitter animosity to each other, their time honored old family feuds and methods of reprisal, their tendency to suspicion, treachery and hostility towards strangers—all this has been far better told than I could tell it; and political and police reports will give the best possible information as to the actual conditions of life amongst them at the present time and of the risks which beset the unwary trespasser. Unfortunately

there is far more than enough to warrant a general conclusion that European life is not safe amongst them, and that to attempt surveys and explorations by means of European agency is merely to invite disasters which might end in grave political complications. Now, without fully endorsing such a general conclusion, which certainly has its exceptions, it may be as well at once to accept the position that if frontier or trans-frontier surveys are to be pushed forward at all, it must be without running any risk of complications which might lead to a

rupture with the people whose country we wish to explore. It is my object then, to point out how, I believe, this may be effectually accomplished on the basis of what has already been done by surveyors in the trans-frontier districts.

Thirty years ago our knowledge of the North-West border was derived from very hasty and imperfect sketches made by casual explorers who passed across that line either on military or political duty, and who doubtless added much to our geographical knowledge, but who could not, from the very nature of their occupations, be expected to secure that amount of precision in detail which is necessary even to the most imperfect military map. The war of 1842-43, added a good deal to our knowledge of geography, but still left us without a map on which any General could work out a strategical scheme with anything like certainty, and indeed, considering the conditions under which the scientific soldiers of those days carried on their work, anything more than they accomplished was hardly possible. It was not until the general survey of India was pushed beyond the Indus that any definite system of military reconnaissances had the necessary basis on which to commence. But about thirty years ago a great chain of triangles was carried down the Indus valley in connection with the whole scheme of Indian triangulation, and from this stand-point the first really scientific military reconnaissances were carried along the strip of country included between the Indus and our frontier, by

Gradual development
of Frontier Surveys.

Lieutenant Walker (now Surveyor General of India). From thirty to ten years ago opportunities have been utilized for laying down from the points of this same great Indus series the exact position of all the far away snow peaks, and prominent points that stood up along the north-western horizon, such as might help to define the great mountain chains and ridges that intersect Kaffirstan and Afghanistan. So that the survey of Afghanistan itself may be said to have commenced some thirty years ago; and the manner in which the information then secured (information which was as exact as good observers and good instruments could make it) has since grown under the hands of many officers into a somewhat elaborate collection of military maps, should teach us how to further extend our knowledge in the future. The exact final use to which any geographical information may be put may not always be entirely clear at the time that efforts are made to secure it. It is a somewhat weak point in our advocacy for the extension of surveys, that we never can precisely point out how or when they will be utilized. Even so late as 5 or 6 years ago, the southern portion of the country occupied by the Mahsad Waziris, together with that strange little promontory jutting out into British territory, separating Peshawur from Kohát, and called the Jowaki Hills, and a small section of country in the neighbourhood of Ambeyla, was all that could be said to have been mapped with any pretence to accuracy or to be properly connected with the geography of India. It was the Afghan war which gave us the first opportunity of making any great impression on the trans-frontier uplands, and it has left us a

heritage in the shape of a large area filled in with well fixed points and peaks extending far away beyond the limits of our actually surveyed maps, which is to us now what Afghanistan itself was some 6 years ago, and which we surely cannot afford to neglect.

In the rough chart on the wall I have endeavored to shew what we know accurately, what exists simply as a triangulated area, that is to say, within the limits of which, the framework, on which to base accurate surveys, is already laid down, and what we know nothing at all about. It is just at present particularly to the shaded or triangulated area that I wish to refer. The exact meaning of that shaded portion is not perhaps fully explained by the word 'triangulated' to any one except a trained surveyor. It means that, not only within those shaded limits but possibly as far beyond them as the highest peaks therein laid down are visible, there is all the information that a man need have to fill in a survey both geographically accurate and fairly complete in detail, if he can use a plane table; but his work should be geographically accurate (that is to say each detail laid down should be nearly as correct in position as are the fixed points around him) no matter with what instrument he works.

But if large instruments are inadmissible for such explorations

What we know of trans-frontier districts, &c. as we must suppose them to be; and if nothing but a small compass is allowable, and distances have to be measured by the rough method of pacing; still, provided only that the explorer be careful to make full use of the points he sees, he need possess only the one faculty (unfortunately not universal) of recognising peaks from various points of view; with some method and care in the keeping of his records, to bring back information of the very highest value for military purposes.

On the other hand it should be equally well understood that when ground has once been prepared in this way for survey, all the elaboration of base measurements and astronomical observations, requiring skill and care to record and calling for the highest attainments of a surveyor, is actually thrown away. There is in fact nothing that can either supersede or take the place of fairly good triangulation, and it would be just as idle for a highly trained officer to start off into those shaded districts with a full equipment of first class instruments, but without a list in his pocket of those fixed peaks and points to which he should refer all his work, as for a mariner to trust to his dead reckoning alone, or to observations for latitude, when within sight of lights and landmarks. So that the matter of making surveys of all countries where points are well fixed beforehand becomes one of great simplicity, depending only on the careful measurement and record of the distances along main routes and of a careful series of observations shewing the bearing or azimuth of all conspicuous points from time to time. And when there are a number of such route surveys, each in itself carrying the means of its own check and verification, crossing each other at various points, it becomes comparatively easy to put together their separate records, which, with a certain percentage of error inseparable from all

such work, will finally amount to a very complete reconnaissance of all that it concerns military men to know most about; and accurate, certainly within such limits as to serve purely military purposes safely and well. This is exactly the class of survey, or reconnaissance, which we are now endeavoring to obtain of all trans-frontier districts which are in the remotest way likely to concern us in the future of our military history. From what has already been said it is, I hope, clear that the expense and risk of European agency in this work is no longer necessary, in order to secure good and fairly accurate information over a very large area extending beyond that which has already been mapped. The use of native explorers has long been a feature in the geographical work of the Indian Survey; and such explorers have by no means been confined to the limits of triangulated areas. They have been sufficiently trained to take astronomical observations to fix their own position, and many of them have been true geographical explorers in

the very highest sense of the word. But it is Application of knowledge gained, to future work. not to work of such a high class as this that I am referring now, although this too, in the future as in the past, will contribute to our knowledge of the geography of regions so far afield as hardly to bear in any way on our frontier. What we want immediately are men capable of finding their way about, through comparatively short strips, with sufficient ability to read a prismatic compass, sufficient powers of observation to lose no important point in their narratives, and sufficient memory to make no mistakes in their records of measurements, which are taken by pacing. And such men are exceedingly difficult to find. Perhaps our best chance of obtaining them lies in making our requirements known as widely as possible. There are, as is well known, a certain number of

men attached to the Frontier and other regiments, who have been fully well instructed in route surveying, and who, many of them, belong to trans-frontier districts, and who would, at first sight, be exactly the class of men required for this sort of duty. But experience does not support this conclusion. So far we have utterly failed to recruit the ranks of explorers from the military class. And there are, I think, one or two very good reasons for the failure. In the first place, this is not the work for which a man enlists into Government service. Ties of kindred and a wider feeling of brotherhood than we can perhaps quite appreciate operate to bring men into the ranks and to keep them together when there; and should there be, as there often is, some good reason

for a man to quit his own hills and come down into the plains, to serve the Sirkar, it may be pretty certainly assumed that it is one that would militate against his going back again, alone, on a somewhat suspicious errand. Even across the border too, there are degrees of education amongst men, and it is not, as a rule, those that have most of it, or those that have travelled far to open up a trade, or on business always more or less connected with trading interests, who find their way into the ranks. But these traders are the men—these, who have already

developed a taste for travelling and who know the difficulties, and are prepared to meet them—that serve our purpose best. From another point of view too, the employment of sepoys as surveyors and explorers, except in such a modified form as may be sufficient for regimental requirements on service, is never likely to meet with very cordial support. Those men who shew the best ability for service of this sort when in the ranks, are exactly the men most likely to shew the best ability in the discharge of their military duties ; and no commanding officer can afford to part with such men for any thing but short periods, and then only under such conditions as may allow of their speedy recall. And I doubt very much whether an old soldier ever effectually rids himself of the atmosphere of ‘Sirkar’ which hangs about him. A man who

Objections of frontier tribes to military explorers and relations with survey. has been drilled is as readily recognised by village folk across the frontier as he would be on this side of it ; and there is undoubtedly in the minds of our border neighbours a possibly well founded suspicion of all things bearing a military stamp. Indeed there seems to be amongst them far more suspicion attached to even the smallest shew of military force than there is objection to making maps of their country. Perhaps the experience of the Kohat frontier party, which was working along the line of the border, during last cold weather, may serve somewhat to illustrate this peculiarity. There were in all some six or seven small parties, each consisting of a surveyor (either European or native) and each engaged on a certain length of the actual boundary, such as to place it, from the beginning to the end of the season, within easy reach of any raiding party that might take a fancy to the camels or other tempting objects belonging to it. One single native policeman was on duty with each camp and there was no military guard whatever, and yet not a single case even of petty theft occurred, although the police reports will shew, I think, that the season was not one of special freedom from the usual raids, robberies, and murders, which keep the frontier police alert and active. Not only so, but very hospitable and pressing invitations were given to the Europeans of the party to visit districts lying far beyond the furthest limits of the western Waziri hills, and there to make such maps as they pleased, provided only that they would duly represent to the great Sirkar, how little worth troubling was such a wilderness of stones and desert. In truth all the trans-frontier people I have yet met between Karrachi and Peshawar, have shewn very great natural intelligence in all matters relating to survey. They know quite well that a map may be useful in preserving their time-honored and jealously guarded old tribal boundaries whose maintenance is almost the one great object of their lives, and about the position of which, a few yards one way or another, more blood is spilt than we shall ever know of. Given, that an explorer is wise enough to identify himself with the cause of the people (which he cannot do if he is known to be a sepoy), he may really do much what he pleases. He should be one of the people, if possible, and he should already have identified himself with their interests in matters of trade or local politics.

Now that not only the whole line of the North West boundary but a good strip beyond it, has been mapped (with one or two small exceptional blanks which we hope soon to see disappear from our maps), a general description of the physical nature of that frontier, about which so much has already been written, and written wrongly, may not be uninteresting.

In general terms it may be said, that from the point where the Indus enters the plains of India, right down to the sea, the boundary follows a rough line indicated by the foot of the hills which lead up to the highlands beyond. These boundary ranges are all much of the same nature, spreading into the plains in rough uneven slopes, and having a wide band of boulder and stone covered country between them and the cultivated districts below—specially in the Peshawur valley and Trans-Indus settlements. Towards the South there are belts of Kachi or uncultivated and waterless wastes, which equally well mark the distinction between the highly cultivated plains of India, and that generally stony and barren highland which, commencing from the boundaries of Hindustan, stretches away west and north further then we can really well follow it. In many parts, this distinction between waste and cultivation is marked by nature with a sharp distinctness which almost looks like the work of men. Nothing on the whole could well be better to serve as a natural boundary between India and the world beyond. Although it might be advantageous here and there to secure the summits rather than the bases of the boundary hills so as to ensure a better watch over the border, yet it generally happens that the conformation of these hills, where such a course would be practicable, consists of long narrow ridges, rising in orderly steps, one behind another, so that little or no advantage would be gained by placing forts on any line of them. Behind the first line there rises another, a little higher, and that again is commanded by the ridge in rear of it, and so on till by successive steps the level of the Afghan or trans-frontier plateau is reached, too far from India to be suitable for posts. To hold both ends of all the practicable passes which intersect the border between Peshawur and the Sea would be simply impossible, on account of their number. So far then, any one passing up and down the long line of our frontier could hardly fail to observe what an excellent demarcation for the frontier of India is this ancient and by no means hap-hazard, one, provided by nature. But the advantages of having all the fertile and cultivable lands to ourselves, and leaving all the stony and difficult hills to our neighbours, has been prized so greatly, as to have made this rule of boundary quite absolute, and, as far as I know, without exception. Possibly in this, as in other cases, the exception is required in order to give point to the rule. Perhaps I may be permitted to draw an analogy for the conditions which should govern the choice of a boundary from the theoretical considerations which would be our guide in the choice of a line of defence. I know that many weighty opinions have been recorded in favor of considering our present boundary as the main line of defence for India. Without venturing an opinion on so

large a subject, I may assume that many of the conditions which should be held to decide the general run of a boundary line are identical with those required for a continuous line of defence, all the more that no line of defence would ever be selected that did not offer facilities for counter attack when such attack became possible. It would be but a poor line of defensive works that did not include an occasional bastion, or some sort of advanced work, in front of the main line, to secure its complete command; to present strong points towards the enemy which must necessarily be attacked and carried before the line can be penetrated; and to offer space for the massing of troops for counter attack when the opportunity for attack should arrive; and herein, a defensive boundary is surely on the same footing as any other line of defence.

Such advantages appear to be quite as desirable in the one case as the other. But there is this difference between the military line and the boundary, that in the former case the line can only be occupied by one of two hostile forces at once; while in the latter it is actually occupied by two forces at the same time which may at any moment become hostile to each other; so that, if instead of pushing out our bastions and advanced works, we allow our own line to be broken into in reverse, we at once put into the hands of our neighbours all the advantages which, scientifically speaking, we ought to secure for ourselves. And this is what happens on our frontier in two instances, both of which are sufficiently remarkable to render it certain that there

must be very many most weighty political reasons for their continuance. Between Peshawur and Kohat is a short direct ride of about 40 miles, but a promontory of Jowaki land intervenes, and, for a direct width of about 12 miles, the road passes through Jowaki country. Further south, again, the direct road from Thal to Bannu, which approximately follows the line of the Kuram river, is cut off by a sort of reversed bastion of Waziri country, which stretches into British territory in the neighbourhood of Bahadur Khel. Of course there is nothing new in these facts, but now that both these and the rest of the border land has been fairly well mapped, it may be useful to point out that both these aggressive tracts are peculiarly well suited by nature to be the advanced bastions of those border friends who may at any moment become border enemies. Jowaki land is a rough wilderness of hills that might surely enough be utterly unprofitable for us to acquire, but which are well suited for the collection of large bands of marauders, who, from this point of vantage, could in times of trouble threaten either Peshawur or Kohat. The Waziri promontory again near Bahadur Khel, is a still more remarkable feature, though hardly so important. In it is situated the curious jagged peak called Kaffir Kot, the supposed stronghold for centuries of all the troublesome spirits of the Waziri border. Even in times of well-ordered peace, such as these, on our frontier, there is no doubt but that Kaffir Kot, and the rugged spurs and hills surrounding it, is the most convenient harbour of refuge for gangs of robbers and marauders of the worst description. This neighbourhood, (near Bahadur Khel), is notoriously the most unsafe and the

worst between Peshawur and Dera Ismail Khan, and it is most probably due to the advantages given to border ruffianism by the existence of such a stronghold as this. Granting that, as a matter of finance, it would never pay to hold such profitless tracts of waste, and that politically it would be unwise to stir up hostility by any proposal to do so, it must be conceded, I think, that so long as our boundary is traced so as to give the advantages of command and attack in the smallest degree to our neighbours instead of to ourselves, the word unscientific as applied to it is by no means inappropriate.

Turning from the boundary to the passes which cross it, and setting aside the well known passes into Northern Afghanistan, the Khyber and the Koram, we come first of all to the Tochi.

Immediately opposite Bannu and north of the Waziri country, there is a direct route to Ghazni following the course of the Tochi river through the Dawar valley, then across the Paltur hill and through ground which is fairly open, direct to Ghazni. We have overlooked the Tochi valley to a distance half way between Bannu and Ghazni, and hope soon to have full particulars of the rest of the route. It is, generally speaking, an open, well cultivated, and fairly wide valley, full of big villages, and easy gradients, so far as we have seen. The height of the Paltur range is considerable, if we judge by the highest peaks, the pass across them being probably several thousand feet lower than the Shutargardan, as the highest peak of the range is only a few hundred feet higher than the Shutargardan pass itself. It will probably prove to be a very open, direct and practicable route between Ghazni and Bannu.

South of this again there stretches a long line of hills of peculiar conformation, called the Sulimani range, which forms a sort of staircase from the plains of India to the plateau of Afghanistan, and this range is intersected with passes. There are about a dozen of them between Dera Ismail Khan and Jacobabad. All these passes have been hitherto considered as comparatively unimportant from a military point of view, but I am inclined to think that their importance is increasing with our better knowledge of them. They all, or nearly all, fall by gentle gradients, but somewhat devious course, following the line of wide torrent beds direct from the plateau to the plains.

Doubtless many of them would offer stiff obstacles to a force penetrating them for the first time from the Indian side, but from all we have seen and can learn about them, this is not the case with regard to a force moving down the hills from Afghanistan. And it is probable that a force such as that which marched under General Roberts to Kandahar would find its way down most of them. However this may be, they are worth the fullest and most careful consideration from the connection which we know to exist between them and the Zhob valley route from the Peshin (which has now been thoroughly explored), and the Bori valley and Thall Choliai routes a little further south. Another route of which, all but a small part, has now been explored and connected with the Surveys north and south of it, is the direct route

from Kandahar to Dera Ismail *via* Maruf and the Sharán river, a tributary of the Gomul. But it will be observed that although all these routes have been so far explored and mapped as to leave no further doubt as to their nature and position, that this part of Afghanistan is left a blank in the shaded map. The reason is that we are much in want of fixed triangulated points throughout this region, without which we cannot claim that degree of accuracy in checking our route surveys, that will make them accord with what has been done elsewhere. Many valuable observations were taken from the peaks in south Waziristan overlooking all this country, but it will be readily understood that another series of observations to the same marked peaks is required from some other point further south than Waziristan, in order to give the base for accurate computation. Now such a point exists in the peak called the Takht-i-Suliman. From such a magnificent peak as this the whole scheme of our frontier triangulation could now be tied together and closed. It is, as it were, the keystone to the whole

Opportunity wanted for
visiting Takht-i-Suliman.

series. No work, that can now be done by surveyors along the frontier, can quite equal this in importance. It would almost be worth a military expedition in itself to secure the results that would be gained from such a position. But in truth no such expedition is in the least necessary. All that is wanted is leave for an experienced survey officer to make his own arrangements to ascend the peak with a small party under the guidance of a local chief. It is the crowning work of a scheme begun by the present Surveyor General 30 years ago, and carried out with much labor and patience by many a surveyor since, so that I beg specially to commend it to the attention of my distinguished audience to-night. Further south than the Tal-Chotial route there are many routes and passes which have lately been traversed by our troops, or explored by special parties for road or railway purposes. All this ground is too well known to be of the same interest to explorers as that which lies further afield. It is now beyond Kandahar—to the routes between Herat and Kabul—that we must next look for all the interest of fresh information and fresh material for mapping. Even these comparatively distant fields are by no means beyond the influence of fairly accurate checks which can be brought to bear from what has already been done by ourselves in the neighbourhood of Kabul, or by the Russians about Herat. It is not of course possible to define in any but the most general terms either what it is that we wish to do, or where our immediate work lies before us. It is sufficient if I have succeeded in explaining that we can now make far better use of the work of native explorers than formerly, from a greater power of checking such work which lies in our hands: that our endeavours are directed to getting all unknown districts traversed and re-traversed by men who belong to those districts, as far as possible, or at any rate by men whose creed and pursuits are likely to commend them to the inhabitants, and that such men are likely to be found, not amongst our sepoys, who are already, to a certain extent, marked men, but among traders, or small local chiefs with a thirst for adventure,

Class of men who do the
best work.

or travelling priests, or in fact any sort of people already well accustomed to travel and with sufficient intelligence and education to read and write. In this, as in other matters, one palpable means of supplying a want is to begin by advertising it sufficiently, and, I trust, that to a certain extent, this paper may help to fulfil the purpose.

There is one question of considerable interest to surveyors about which I may venture to make a few remarks before concluding.

When we have got together all our material for making maps, do we always succeed in so representing our information as to make it of the greatest practical use to those military men for whose use our trans-frontier maps are at present put together? When it is once ascertained that any tract of country is inaccessible, or entirely unsuited to military movements of any sort, it would seem, at first sight, that it had almost better be left alone, *provided* that time and labor are wanted in other and more important directions; that is to say, that more time and more trouble should be given to important military details such as roads. There is one question, in conclusion, which would, I think, be the better for the light of some discussion, which bears on the value of our survey maps and reconnaissances from the purely military point of view.

Do we always embody our information on the face of the map in such a way as to be of the greatest practical military value? and do we always employ our time in the field, when the opportunity is afforded by a campaign, to the best possible advantage? To take the latter question first. There is an immense deal of ground which is of no practical military value so far as the action of troops is concerned. A great deal of rough, broken and impracticable hilly country, might sometimes, apparently, be left out of the map altogether, and the time and labor expended in detailing its features might, apparently, be more usefully expended in work of another nature more directly dealing with those physical features which affect the marching of troops and their strategic combinations. It may not always be quite clear what is to be gained by working along lines of big peaks and rough troublesome hills which afford every opportunity to an active enemy to engage in a sort of irregular fight in which all the advantages would be on his side; but it should, by this time, be well understood that the very back bone and frame work of the survey, the very essence of that final truthfulness, which should distinguish every military map which is intended to serve any useful strategic purpose, lies first and foremost in this visiting and fixing of big peaks and commanding mountain chains. These serve to define the geography of the country, and this geography indeed is inseparable from good mapping. Every experienced surveyor knows that if he is to have any satisfaction on the final adjustment of scattered surveys and the completion of a map which shall place important strategic points in accurate relative position, there must be no shirking of big peaks and commanding points. And this must ever be the work of experienced men, because it is only by experience that any man can so

learn to recognise the features of nature in their ever varying aspects, under different conditions of atmosphere, and different points of view, as to know with fair certainty where he is, or even what he is observing. But when we have done this, and when opportunity is perhaps denied for work far afield from the position occupied by troops in force, when it comes to detailing the minor features, to the careful mapping out of all those important details of roads and passes, villages and rivers, which all text books on military reconnaissance so carefully sum up as if they were the beginning and end of all military surveying whatsoever, it is then, I think, that possibly we might become a little more military in our order of work, and depart a little more from the rigorous proceedings of exact surveys. I am not advocating any laxity of work, but it must be remembered that in the field, time is the governing principle of our work—just as much as cost is its governing principle under ordinary conditions in India. And time to be utilized to the best advantage in purely military map-making might perhaps be better applied in unequal quantity—the more to the important military details, the less to the unimportant. And here crops up the question as to who knows best which are and which are not the important military details. I think, undoubtedly, that the chief military authority in the field should judge. I cannot quite agree with an opinion which I know to be supported by the highest authority, that surveyors from a civil department should be the geographers—and perhaps topographers of an expedition—but that there should be a recognised and separate class of military mapping which should belong exclusively to military officers of a military department. I think that officers of the survey department should be military enough for all such work, and that they should be prepared to work hand in hand (for there is always more than enough work for everybody) with any one engaged on similar duty, with the assurance that in these days there is no danger of their special work as geographers being disregarded when opportunity offers of pushing forward the interests of geography. In this way there would be an even system of give and take—we surveyors would gain by the information which could be afforded us by the officers of the Intelligence branch of the Quarter Master General's department, information as to nomenclature, tribal distribution, &c., which is just as important as topography on the face of a map. The Intelligence officers, on the other hand, would gain by being relieved from the duty of making what, with all respect, but I think sufficient reason, may be termed inferior maps. Thus their work would be still distinct, but distinct with a view to ultimate combination, and for properly effecting that combination there should, I think, be a far closer connection between these two branches of service than there ever yet has been. Perhaps we may yet see a purely military branch of the survey department established, whose chief aim it may be to raise the whole standard of military map-making to a far higher level than we have hitherto been content with, partly by affording a wider field for practical instruction to all officers who wish to learn, partly by studying those details of map information which are not represented by rivers and mountains.

As regards the style of our maps when finally turned out, I have nothing to say further than that we are doing our best—but doing it, perhaps, a little in the dark. It is the opinion of military authorities that we want on this point, and if there are weaknesses and omissions which might be remedied we ask for them to be pointed out.

Now, I have to apologise for the indiscretion of entitling my paper *Frontier Surveys* when it has dealt with nothing but a very little corner of the frontier. It would have been far more entertaining to have glanced all round it—at Baluchistan and our position at Quetta—at Kaffirstan, Gilghit and Chitral, and the wild waste of snowy wilderness which Colonel Tanner knows so well how to sketch—to have followed Harman a little way towards the giant peaks of Sikkim—or to have accompanied Woodthorpe into his well loved hills on the Eastern frontier, where the shadow of mystery seems even now induced to linger over the course of the Brahmaputra. When I think of these, I feel that I owe an apology for the dryness of my paper. But they must all speak for themselves. I sometimes wish that they could speak in a manner which would appeal a little more directly to public sympathy than do the pages of the *Annual Survey Report*.

At the close of Major Holdich's lecture, His Excellency the Commander-in-Chief rose, and, addressing the audience, observed that there were two points suggested by the lecture on which he desired to make a few remarks. In the first place, he considered that no British officer should be permitted to cross the frontier, even for a purpose so important as the survey, until it had been demonstrated that no political complications were likely to ensue from the enterprise; and that only with the approval of the political authorities, and the consent of the Government, could any officer be permitted to undertake such a work. His Excellency instanced the mountain of the Takht-i-Suliman, alluded to by Major Holdich, as a place which could be utilised only with the special authorisation of the Government, and considered that great danger would arise from any surveying operations being attempted beyond the frontier without special permission having been first obtained. His Excellency then observed that a common fault, in almost all survey maps he had seen, appeared to him to be that, for practical military purposes, they were not sufficiently clear and explanatory, and generally exaggerated the features of the country so greatly as to be an unsatisfactory guide to an officer conducting the march of a force through it. He said he desired to see an improvement in that respect, so that a survey map, for military purposes, might be intelligible to an officer in command of an expedition, and enable him to make his plans with confidence in the knowledge of the country which such maps should give him.

At the conclusion of Sir Donald Stewart's remarks, the Surveyor General, Lieutenant-General Walker, observed that he wished to be allowed to notice two points in the remarks made by

His Excellency the Commander-in-Chief, namely, *first*, the duties and position of officers of the Survey Department attached to an Army in the field, and *secondly*, the general clearness and legibility of the maps published by the Survey Department.

As regards the first subject, he would point out that there is a broad line of demarcation between survey operations executed for geographical requirements and those executed for the requirements of a General Officer in command of an Army in an enemy's country. The former may be regarded as purely civil, conducted with a view to the extension of science by the acquisition of new geographical information; the latter as purely military, conducted in order to obtain for the General all desirable information regarding the topography of the country in the vicinity of the principal routes which are likely to be traversed by the army under his command. He was of opinion that, as these operations were essentially distinct, they should be performed by separate agencies—the geographical and scientific by officers of the Professional Survey Department, the military by the officers of the army. If the Indian Survey Department was large enough to supply a sufficiency of officers for the performance of both the geographical and the topographical, the civil and the military operations, there would doubtless be much advantage, as regards co-operation and economy of power, in having the whole of the survey work executed by a body of professional officers who have been trained to work systematically and in co-operation with each other. But the Department cannot furnish a sufficiency of officers to undertake all duties of this nature when the military operations are being conducted on a large scale and cover a great extent of country, as was the case in the late war in Afghanistan, when several armies were employed simultaneously in different regions widely apart; it cannot then do more than furnish a sufficient quota of officers to undertake the acquisition of new geography; consequently the work of military reconnaissance and topography must, under such circumstances, be entrusted to other hands.

In placing the professional geographers under the immediate orders of the Generals in command, there is this danger, that they may be removed from their legitimate sphere of operations and employed in military topography and reconnaissance; thus valuable opportunities of acquiring scientific knowledge may be lost, and the time of the officers may be wholly misspent, at least as regards the object for which they were specially attached to the army. Military route surveys and sketches, however valuable they may be for military requirements, are quite inadequate of themselves to furnish complete geographical maps; and it is only by specially aiming at the acquisition of something more than suffices for the military requirements of the moment, that an accurate and complete map of the surrounding country can be prepared.

As regards the second subject noticed by His Excellency the Commander-in-Chief, General Walker remarked that the maps which have been published by the Survey Department of late years are undeniably less clear and not easily legible to the general public than those

which were published a quarter of a century ago; but then they are greatly more numerous, and are produced with far greater rapidity. In former years, maps were drawn with all their hill features represented in brush work with delicate gradations of shade and variations of tone, and a variety of colours was used in order to assist the eye in distinguishing other features. Such maps were often very beautifully executed, as notably in the instance of those of the Jhelum and Rawal Pindi Districts under the late Colonel Robinson, R. E. But they could only be reproduced for publication by lithography, or some such process, which necessitated their being re-drawn by hand in the first instance; and this took such a long time that many years elapsed between the completion of the survey and the publication of the map. At the present time, the maps of the Indian Survey Department are usually published within a few days, or at most a few weeks, after they are completed by the surveyors and sent in for reproduction; but this is because photography has been introduced in order to facilitate and expedite the reproduction, and photographs of the maps are taken and transferred to lithographic stones or zinc plates, and thus the slow intermediary process of re-drawing by hand is avoided. The gain in time has been enormous, and maps are now reproduced and published in a few hours which might have taken years under the old system. But, unfortunately, this very great gain in time has been attended with much loss in the clearness and legibility of the maps. In order that they may be satisfactorily reproduced by photolithography or photozincography, the maps must be drawn throughout in pen and ink work, all features of every description being represented simply in black and white, without any attempt to produce any of the mezzotints or variations of shade which are of such service in giving the proper relief to the hill features; consequently, photo-lithographs are not nearly so clear as hand-lithographs. But the gain in time far outweighs the loss in clearness. For example, during the Afghanistan war, over 400 maps were reproduced by photozincography and 125 copies, on an average, of each map were printed, within an interval of five days—including Sundays and holidays—between the receipt of the map in manuscript in the Surveyor General's Office and the issue of the prints to the public; in some instances prints were despatched to the Generals and Staff Officers in Afghanistan by the third day.

It is of course to be regretted that maps shaded in brush work cannot as yet be satisfactorily reproduced with the aid of photography. But for some time past, Major Waterhouse, who superintends the photographic branch of the Surveyor General's Office, has been devoting his attention to the improvement of photographic processes with a view to the reproduction of mapping in brush work and mezzotint; and there seems some probability that the lately invented process, called heliogravure, may be rendered applicable to the object in view. If so, the ground lost as regards the clearness and legibility of the maps may be recovered; while the gain in time by the substitution of photography for hand drawing in reproduction of the maps for publication, will still be maintained.

On General Walker resuming his seat, General Wilson, the Chairman, rose and said :—

I am quite sure you will all join me in thanking Major Holdich for his extremely interesting, and I will add, instructive lecture.

I really know of no science which is of greater value to a Commander in the field, than is that of the Surveyor, by whose art all the principal features of a country, such as roads, rivers, mountains, hills, plains, valleys, marshes, lakes, cities, villages, and the like, are delineated and carefully and accurately marked on maps, by means of which future operations of war can be leisurely and conveniently considered by those who are entrusted with the conduct of a campaign.

Major Holdich has said that there are good reasons why we should endeavour to increase our topographical knowledge of the North-West frontier—I think so too; indeed I feel sure that I could furnish several reasons, some of them strong ones, why this is, as he says, desirable; but all things considered, perhaps it is not advisable for me to enter upon this point; especially as those I address have full knowledge of the matter.

Major Holdich has remarked—that recent military operations on the North-West frontier and in Afghanistan have afforded opportunities for adding to our stock of topographical knowledge—but he did not tell you, as I think he well might have done—how well those opportunities had been availed of, and under what difficulties the new information had been obtained—nor did he tell you of the risks, dangers, labour and exposure which had been frequently undergone by the surveyors—yet I have been told that this was often their lot—and I am sure you will be surprised when I tell you that during the two campaigns, the Field parties, whose zeal some of the Commanders would occasionally have been glad to have moderated, managed to survey, in more or less detail, more than 40,000 square miles of country, while, during the same period, some 7,000 square miles more were sufficiently explored by means of native agency—and many remote regions were for the first time seen by an Englishman.

Now, when you remember that this large increase of topographical information was gained during hurried marches in the midst of a hostile population, you will possibly agree with me that the conduct of the several officers employed beyond the frontier on the duty of surveying during the recent war, reflects great credit on the department to which they belong.

It only remains for me to convey to you—Major Holdich,—the thanks of this meeting and the members of the United Service Institution of India, for your kindness in addressing us to-day on so interesting a subject as the survey of the North-West Frontier.

V.

INDIA 30 YEARS AGO.

*Text of a lecture delivered at the Rooms of the United Service
Institution of India, on the 28th June, 1882,*

BY

COLONEL J. G. MEDLEY, R. E.

The Hon'ble Sir C. U. AITCHISON, K.C.S.I., in the Chair.

I hope that I may be able to interest you for a short time this afternoon by asking you to follow me in a brief retrospect of some of the changes which have occurred in India during the last 30 years.—I do not propose to trouble you with figures, or with statistics of trade, commerce or population,—I only propose to note those changes which, to any one who has known India as long as I have, are sufficiently patent and remarkable, and many of which are instructive as well as interesting.

To begin with, let us see what the means were of getting to India 30 years ago. The Overland service had been established for some years, though numbers of people still came and went by the old route round the Cape. The Overland journey was, however, a more leisurely affair than it is now. When I came out, we stopped half a day at Gibraltar, a day and a half at Malta, and took three days going through Egypt. The Railway from Alexandria to Suez had not even been begun; so we went in small steamers up the Mahmoudia Canal from Alexandria to the Nile, then in another steamer down the Nile to Cairo, and then crossed the desert from Cairo to Suez in small omnibuses or vans.

All the P. and O. boats went to Calcutta in those days, the Bombay mail service being performed by the vessels of the Indian Navy. So we, Calcutta passengers, paid a pleasant visit to Point de Galle, got a peep at Madras, and 47 days after leaving Southampton, found ourselves steaming up Garden Reach and making our first acquaintance with the City of Palaces.

Those were exciting times. At Aden we got the news of the bloody and indecisive battle of Chillianwala, and so we griffs naturally hoped to be out in time to take part in the Second Sikh War. At Calcutta, we heard of the crowning victory of Goojarat, but as it was not then certain that even that would finish the war, we were ordered to proceed up country as quickly as possible. Now, as there were no Railways, and even Horse Daks had only lately been established in the North-West Provinces, "as quickly as possible" meant a journey by palankin dak from Calcutta to Allahabad which occupied 12 days, and the delights of which in the month of March I need not describe.

From Allahabad to Cawnpore we got on by a machine called an "equirotal," a 4 wheeled carriage dragged and pushed by coolies, but from Cawnpore to Kurnal or Umballa, I think we got the horse dâk. Beyond Umballa, the road was unmetalled, and the unhappy traveller to our two then frontier stations, Loodiana and Ferozepore, had to struggle on as he best could, through clouds of dust and sand.

Such was the ordinary mode of rapid travelling then, as indeed it is now over a large part of the country. In other parts, as in Western India, bullock Shigrams were in vogue, which were certainly a degree better than those portable coffins, the palankins. On the great rivers, people travelled, in Budgerows which were tracked or sailed up stream, or floated or rowed down stream, many weeks or even months being spent on the voyage. In that delightful book, Bishop Heber's Journal, you will find a full account of the various modes of travelling at a somewhat earlier period, and in reading those charming pages will almost regret the introduction of Railways. Of all inventions, says Macauley, the alphabet and printing-press alone excepted, those inventions which have facilitated locomotion have done most for the civilization and progress of mankind. How completely the aspect and conditions of Indian life have been altered by the Railway, those can testify who knew India when Railways were not. But their effect has been still more marked in England, simply because there they have been more extensively diffused, and I suppose, if we were asked briefly to describe wherein the England of to-day differed most from the England of 50 years ago, we should say, and say truly, that it was in the more frequent travelling that now took place.

I have no doubt that most of you have read some at any rate of Miss Austen's novels. Admirable as they are in the delineation of character, what struck me most in reading them was this—although they describe English middle-class life of only 60 or 70 years ago, that life is as completely removed from the life of the present day as if it were the time of Queen Elizabeth. People in England in those days scarcely ever moved from their homes except, perhaps, for a short journey to the nearest county town. A journey to London was an expensive and tedious undertaking not lightly to be thought of. The interests of even the well-to-do and educated classes were, therefore, wrapped up in the society and gossip of a narrow county circle, diversified only by an occasional visit to Bath or London. Such a life would be to us now simply intolerable, because the conditions of life are so different, and that difference has been produced almost entirely by the agency of the Railways.

Well! 30 years ago in India, Railways were scarcely begun, and even metalled roads were few and far between. That was a significant nick-name (though a shocking bad pun) which was bestowed on the first Indian Government who began to metal our roads, Lord William Bentinck, when he was called William the *kunkurer*. Alive as we were to the great results that had been produced in England by Railways, it was some time before their immense importance to India was recognized. Curious ideas were prevalent that the natives would

not travel by them, that they were insensible to the value of time, that their caste prejudices would interfere. We know now how such ideas have, from the first, been triumphantly refuted, how the railways have added to the wealth of the country, to the military power of the Government, to the security of the people from famine, and to their comfort and convenience generally; but what I wish specially to point out is, that the extension of railways is not a mere professional question to be urged only by Engineers on the 'nothing like leather' principle, but that it has been, from the first and still is, a question of the difference between wealth and poverty, plenty and starvation, happiness and misery, life and death. Time was when, if it had been asked what is the first duty of an Indian Government? the reply would have been, to collect the Revenue—And the next? to build Jails and Kucheries—And then? to build Dispensaries and perhaps Schools—and then? if there is any money left, to bestow a little attention on roads and canals—Now, I suppose we should all agree that, next to the protection of life and property, the communications of the country are of such vital importance that rather than that they should be neglected, it would be better to leave the Jails and Kucheries, the Schools and Dispensaries, and even the Revenue, to take care of themselves.

And now let us briefly note some of the important political changes that have taken place in the period of which I am speaking. 30 years ago, Oudh, British Burmah and Nagpur, were still unannexed to the Empire, and the Punjab had only recently been absorbed. I was amongst the earliest of those sent to do duty in Lord Dalhousie's model Province, and I fear that few of us were fascinated by our first acquaintance with its arid and burning plains—its muddy rivers—its horrible dust-storms—its trying climate. The trans-Indus territory, which I described to you in this room nearly 2 years ago, was then regarded as the very Ultima Thule of civilization. But the Punjab Government fortunately possessed a Secretary who, to a fertile imagination, added a flowing and vigorous pen; and the reports which Mr. Temple issued year after year, with such singular felicity of diction, threw dust in our eyes metaphorically as the climate did literally, and convinced us, against the evidence of our own senses, that the Punjab was the finest country in the world, the people the finest people, the climate most salubrious, and that we ought only to be too thankful to the destiny that killed off one half of us and invalidated the rest, while entrusted with the high and patriotic mission of civilizing that noble Province. Well, the work was done and remains, though most of those who did it have departed, but the names of the Lawrences, of Edwardes, of Chamberlain, of Nicholson, of Montgomery, of Napier, of Tayler, of Dyas, and many others, recall those by whose exertions, in peace or war, the Punjab has been brought to its present state of prosperity.

30 years ago and John Company ruled over the land—kindest and best of masters—slow to move, perhaps, in the onward path of progress, disliking change and distrusting innovation, still somewhat mindful

of the trading origin from which he had originally sprung, yet assuredly not unmindful of the responsibilities which had come to him with the acquisition of empire. His rule was eminently paternal, from the Governor General, to whom he regularly signed himself "We are your affectionate friends, John Shepherd and 13 other Directors," and the Commander-in-Chief whom he sent out after regaling him with a first rate dinner at the London Tavern, to the youngest writer or cadet who was sworn in at the India House, and affectionately enjoined by the Chairman to be kind to the natives, to learn their language, and not to get into debt.

And so we came out to this country, and found ourselves amongst a handful of white men helping to rule over 200 millions of dark skinned people—strangers to us in language, race and religion—with an army of 30,000 white soldiers and ten times that number of natives of all classes and creeds; and none, except a few of the more thoughtful among us, wondered at the strange spectacle, or thought it at all remarkable that we were not pitched bodily into the sea. And then came the Deluge; and the mutiny of 1857 startled us roughly from our sense of security, and made us feel the isolation of our position and by what a frail tenure our sovereignty was really held.

And then, when the storm was quelled, poor old John Company was condemned and executed, without much form of trial; and, not without many fears and misgivings, and much difference of opinion, the Government of India was transferred from the Company to the Queen, and the old Indian Army was abolished or amalgamated with that of the Crown. Well! 25 years have passed since then, passion has had time to cool, and we may perhaps now calmly enquire whether the measures then carried out were wise or not.

I think we may fairly say that, as in most cases, both the bad and the good that were so confidently predicted were exaggerated. The transfer of the Government from the Company to the Crown, or rather from the nominal to the real authority of the Queen, has been beneficial in many ways, chiefly I think in this, that it has tended to evoke a feeling of personal loyalty on the part of the chiefs and the people of India, which I cannot but think is of the highest political importance. Its disadvantage to many has appeared to be, that it has brought India more or less under the influence of parliamentary—which means party—Government. Fortunately, the good sense that is never wanting in a body of Englishmen like that composing the House of Commons, has hitherto prevented their interference from being mischievous. But this is a subject which, for many reasons, I will not now further discuss.

As to the amalgamation of the Services, I think we of the old Indian Army have little cause to feel injured. While one officer of that army is a Peer of the Realm and Governor of Gibraltar, while a second is Commander-in-Chief in India, and a third is Commander-in-Chief at Madras, we may view with complacency those changes by which such appointments have been rendered possible. And, looking at the subject in the broadest point of view, I for one cannot help feeling

that the change was inevitable, if only because any Local Army, even though raised in the name of the Queen, must have occupied a lower status than that at home, and so must have suffered in prestige and efficiency. We know very well that there was a good deal of jealous feeling between the two services prior to the amalgamation, though this was, to a certain extent, kept down and smoothed over, partly by the camaraderie of professional feeling, chiefly, perhaps, because the old Company's Army had gained for itself a reputation won not lightly in many a battle field, which, together with certain substantial pecuniary advantages, made it easily forgive a few unworthy sneers. But the mutiny had destroyed so much of the past that any new Local Army would, I think, have been an anachronism.

We have seen various changes too in the Army itself as well as in its organization. In the European forces, we have seen the change from long to short service, with what advantages and drawbacks I will not now discuss. We have seen the souls of the Officers vexed by numerous examinations, doubtless not without much profit to themselves and the service at large ; we have certainly seen the bodies of the men far more efficiently cared for, better lodged, better fed and better clothed, and the mortality very much reduced from the time when the first deduction from the recruits' pay used to be made for the price of his coffin.

In the native army, we have seen soldiers drawn from many castes and classes hitherto untouched, and if the rise in the price of labour has made recruiting more difficult, we ought, at any rate, to welcome it as a sign of the increasing prosperity of the people.

We have seen the whole army far more efficiently armed, by the change from the old smooth-bore musket to the Enfield, the Snider, and finally the Henry-Martini ; and we have at last recognized the necessity of a proper organization for such departments as the Transport and the Intelligence. In a word, even if the quality of the individual officer and soldier has not been improved, the army has been made far more efficient as a powerful fighting machine.

30 years ago, and Haileybury flourished and Addiscombe too, and the nomination system generally, and the competition-wala, was not. We know what dire consequences were predicted from the change ; how India was to be over-run by pale book-worms in spectacles, who would not be able to ride and who would eat peas with their knife. Well, those dreadful consequences have happily been averted, and though I am far too prejudiced to admit that the new men are any better than the old, candour compels me to acknowledge that, at any rate, they are just as good. Now even natives are being admitted into the sacred ranks of the Civil Service, and before long, we may see our worthy Deputy Commissioner here superseded by a native Chairman of the Municipal Committee or a native Lord Mayor of Simla.

30 years ago, and India was the property of the Services, and other people were Interlopers, Uncovenanted, and outer barbarians altogether. The Civilian of the old school had only just become reconciled to the existence of the planter, when he found India suddenly invaded by

the Railway Engineer, who disturbed his equanimity very considerably, more so even than the member of the new Educational Department who, he found to his astonishment, was a scholar and a gentleman, though he had never been to Haileybury. Yes, we have lived to see a considerable bouleversement of our ideas in this respect, and I have heard quite recently that, even in Simla, there were people so ignorant as not to know what a Member of Council was, but who said they supposed it was something Indian.

There have been too not a few social changes in the last 30 years. Before the Railway era, a journey to the Hills was an expensive affair, not often to be undertaken by those living at a distance or by people of moderate means. So the greater number of ladies made up their minds to stay down in the plains all the year round and the children were sent home or died. Now, all that is changed, and even if the inferior being is left to grill and growl in the plains, he has the satisfaction of knowing that his wife and children are enjoying a good climate and that the much dreaded more distant separation may at least be postponed.

Formerly, too, the idea of short leave being taken out of India would have been impossible. Now, as we know, it is an every day affair for a man to take his 3 months privilege leave to England and to recruit mind and body by a short visit to his native land.

It is not altogether an unmixed advantage that he should do so. The leave formerly taken in India enabled a man to see other parts of the country than those in which his immediate sphere of duty lay, and whether shooting, or geologizing, or simply marching about, he made acquaintance with the country and the people in a way which is more rare now-a-days. Indeed, I very much fear that in proportion as our facilities of communication with England have increased, our intimate knowledge of the country and the people has decreased. I do not say that there are not compensating advantages, but we must not shut our eyes to the drawbacks.

Another change too has slowly and insensibly passed over Indian social life. With the increased facilities of travelling, old Indian hospitality has very much lessened, and our manners and customs are daily drifting more and more to the stereotyped English pattern. Such a change was of course inevitable, and in many respects it has been beneficial, but it is impossible not to notice it in a retrospect of the past, however brief. I wish I could say that our Hotels had improved with our other travelling arrangements, but that, I fear, cannot be truly said.

Let me briefly chronicle a few more changes in our social manners and customs. When I first came out to India, Hookah smoking was not yet extinct, and there were few dinner parties, outside Government House, where, before the cloth was drawn, a small train of servants did not enter the room, deposit the little squares of carpet behind their master's chairs, put on them the richly cut glass hookahs, unwind the long snake-like tubes, and then place the silver or amber mouth-pieces in the hands of the sahibs, when the grugling noise of the hookahs and the sickly perfumed smell would mingle, pleasantly or unpleasantly according to your taste, with the conversation.

Mess Guest nights too were things to be remembered in those by-gone days. Now, as is well known, under our improved educational tests, the conversation on such occasions is of a highly improving and scientific nature, and almost entirely devoted to professional topics. Then, I am afraid, we were not so particular, and after the cloth was drawn, many songs were sung, wine was succeeded by drinks of a more profligate description, and Van John and unlimited Loo led to the awful consequences of grilled bones, or of a dish I once heard called "fixed bayonets," and which, though I never partook of it, was described to me as a fowl stuffed with chillies and boiled in spirits of wine. Yes—I fear that not a little hard drinking and gambling went on in those days, and that even duelling was not unknown, and in those respects we have certainly improved very much.

In another respect I am equally certain that we have fallen off. When I see the number of young ladies now riding up and down the Simla Mall, or thronging the Simla Ball rooms, I cannot help remembering that 30 years ago such a state of things would have been impossible. Of course, I am perfectly aware, that they all might have married over and over again if they had liked, and I beg them to consider the miserable state of the bachelors and to look upon their dejected countenances, and to take pity upon them before the season is over. There is no doubt that, 30 years ago, even Ensigns rushed into matrimony in a way which would now be thought perfectly reckless in the possessor of an income of 250 Rs. a month. And somehow they got on very well; the lady drove about in a buggy and never dreamed of going to the Hills; the staff appointment came in due time, though sometimes not quite so fast as the children; the rupee was worth more than two shillings; the cost of living was altogether much less, and I can't help thinking that the Europe ball dresses were less expensive.

30 years ago, and there was no Telegraph, and the postage of a letter from here to Calcutta cost 7 annas, and the English Mails only arrived once a month, and the news was six weeks old. Well, as far as I can recollect, we were just as happy then as we are now, and as I have no doubt our predecessors were in the days when it took 18 months to get a reply to a letter to England. The human feelings adapt themselves to circumstances in a very satisfactory manner, and I have no doubt that, 30 years hence, our successors will look back with contempt on our present feeble means of communication and wonder that we could so easily have been satisfied.

The improved facilities of communication have, as I have already remarked, not been unattended with their drawbacks. It is impossible not to see that men nowadays are less than ever disposed to make India their home, and in some respects take a less kindly interest in the country and the people. The old race of Indian Nabobs, with hookahs and dried up livers, telling impossible tiger stories, and interlarding their conversation with Hindustani phrases, has altogether disappeared, even if it ever existed off the stage, which I doubt. But it is equally impossible to recal the real Anglo-Indian of the past under the different

conditions of the present. The barrier between the two races is certainly stronger now than it ever was before, though I think we may fairly say that it is a barrier erected rather by the natives than by ourselves; and until the two great questions of caste and the social position of women are differently regarded by them, I do not myself see how that barrier can ever be more than partially removed.

This leads us, however, to the consideration of a very interesting question. How far have the changes of which I have been speaking affected the people themselves? and to this it is not easy to reply. We must remember from what totally different stand-points such questions are viewed by us and by the natives. The vast majority of the people of India are, and must be, for many years, perhaps generations, to come, chiefly if not solely affected by what concerns their physical welfare; the comparative cheapness of food and clothing; their safety in person and property; their immunity from oppression. They are as little influenced by public spirit, patriotism and motives of that nature, as the cattle that they tend in the fields. But that vast majority, if capable of giving a collective and intelligent reply, would, I think, say that they are better off now than they ever were before. If the price of food has risen, so has the price of labour; clothing is certainly cheaper; travelling, if still a luxury, is at least an attainable luxury. Above all, the area of land under cultivation has considerably increased, and the extension of Roads and Canals has largely protected them from the horrors of famine. Doubtless, the poverty of the people is still extreme even when measured by a very low European standard. Doubtless, their ignorance and apathetic contentment with their lot are still excessive. But, measured by their own standard, we have, I think, fair reason to conclude that their lot in life has been considerably ameliorated. For the rest, we must have patience; 30 years can do little to break down the conservation of 30 centuries.—It is something if even a commencement has been made.

In one respect, I think a very important step has been taken on behalf of the people. Within the last four years considerable progress has been made in the introduction and development of new industries, which are tending to raise some portion of the population, however small, above the dull, dead level of ordinary agricultural pursuits.—Indian Tea is already an important industry.—Tobacco is rapidly becoming so—Mills have sprung up at Bombay, Calcutta, Cawnpore, and elsewhere; and if British supremacy has, as is alleged, destroyed some of the old native manufactures, we have at least given them others in exchange. Next to the improvement of the communications of the country, this seems to me, I own, one of the most important questions of the day, affecting as it does so vitally the well-being of the people. All the laws and good government in the world are useless if the people are starving; and so long as so many millions of them are living in daily dependence on the vicissitudes of the seasons, and with nothing else to fall back upon for generation after generation, starvation is always a possible contingency. If the people increase and multiply too fast for the land to support them, and if they have no other resource

but the land, nature will take her own steps to prevent the population from attaining undue limits. Meanwhile, there are vast tracts of excellent soil calling loudly for water and population, and some day, I suppose, Engineering and Statesmanship will combine to solve the problem of balancing the land and the people.

But there are other classes above that of the uneducated and unthinking millions, few though they be in number, and it may be interesting to enquire what *they* think, after a quarter of a century, of Railways, Telegraphs, Education and progress generally. How has it affected them, and what effect will their opinion have on the great body of the people? Now I think that the classes of whom I am speaking may be divided into three. First, the Chiefs and Nobles of the land—Second, the Trading class—Third, the Educated class, which is the product of our Schools and Colleges.

With regard to the Chiefs, I think we may fairly say that they have accepted the inevitable, and that something like a sentiment of personal loyalty is gradually springing up amongst them, even towards an alien and distant Sovereign. The recognition by the Government of the right of adoption—the scrupulous good faith with which they have so long been treated—the care taken on every occasion to respect their rights and privileges and dignities—cannot but have produced a feeling of confidence, if not of attachment. But it is undoubtedly the case that there is a certain number among them to whom these remarks will not apply, men who have sunk into debt and vice and degradation—who, from no fault of ours, must hate us with a bitter hatred, and be a standing menace to our rule. As to the Trading class, I think we may apply the homely saying—"They know on which side their bread is buttered"—they know very well that under the best and most enlightened Native Government, their wealth and property would never be so secure as under us.

For the educated class, I can only say that it is a child of our own creating, and we must, therefore, be patient with its eccentricities, its waywardness, and even its dangerous humours, for the sake of the possible manhood hereafter. 30 years ago and the educational problem had only just been tackled, and a very difficult problem it is. Chaucer, Shakespear and Milton, from a Bengali point of view, are perhaps more ludicrous than edifying; and as I, for one, believe that the Literature and the Drama of a nation are part and parcel of its social and political life, I cannot but fear that it is a waste of time to endeavour to create taste for the one until there is at least the power of appreciating, if not partaking, of the other. Science stands on a different footing, for it is, or ought to be, common to all nations and countries, and to be totally independent of all political and social distinctions. And by Science, I mean *Scientia*, or that practical knowledge which teaches every man to do better the work of every day life, whether to grow two blades of corn where only one grew before, or to cut a Canal or erect a Steam Engine.

The Anglo-Indian Press has, perhaps, not made so much progress within the last 30 years as might have been expected from the largely

increased number of readers. Still, we have up-country, the daily Pioneer and the Civil and Military Gazette, in lieu of the bi-weekly Mofussilite, and Delhi Gazette and Lahore Chronicle ; and, I think, we must admit that both they and the older papers published at the three presidency towns have fairly kept pace with the progress of the times. But we have now no such good weekly paper as The Friend of India when edited by Marshman and Townsend. The Calcutta Review too was then in its palmy days, as may be seen by the old articles now being re-published, which were written by such men as Torrens, Elliott, Lawrence, Buist, and others. There was even a very good monthly magazine published at Meerut. Of course, the reason of this apparent want of progress is not far to seek. With the closer communication with England, men now prefer to send the productions of their brains and pens to the London market.

The Native Press is as yet purely an exotic of foreign growth. Like literature and the drama, a healthy Press can only spring from a healthy political life, and it is useless to look for the one while the other is non-existent. We are so accustomed to Liberty and the adjuncts of liberty ourselves, that we are naturally anxious to bestow them upon others, especially those committed to our charge ; but we must remember that, like fishes out of water, all cannot breathe in free air. After all, the great end and aim of all good government are to produce certain practical results by the best available means, and to regard the end as of more importance than the means, by which it is attained.

Within the last 30 years, our older Hill Stations have yearly become more and more crowded. Murree has been invented for dwellers in the Punjab, and Kashmir has become the Indian tourist's Switzerland. The all-conquering Mr. Cook has now invaded us, and we are threatened with swarms of personally conducted tourists and with proposals to take Indian gentlemen to Europe and show them some of the wonders of the West. Well, the more the people of both countries travel and see something of each other the better, for after all there is no barrier between them like that of Ignorance. It will be something to let the people of India see somewhat of the power and wealth of England and to discover whence they are derived. It will be something to let our own countrymen see that India is not merely a land of Tigers, Cholera and Currie powder, and that we Anglo-Indians are not a set of oppressors and vampires, sucking the blood of the people and anxious only to keep them down, even if they find their dreams of Oriental luxury and of the gorgeous East somewhat rudely dispelled. They will perhaps find, to their surprise, that life in India is often very monotonous, and that an Anglo-Indian Official is a hard-worked personage, with little to cheer him beyond the consciousness of doing good work in a quiet way, and bearing a part, however humble, in the solution of one of the greatest problems ever committed to a nation.

It would be wrong in us and fatal to the cause of true progress to over-rate what we have done for India, or to exaggerate the good

effect of our rule. The ascendancy of a foreign race—aliens in language, religion and social life—can never be popular; nor, I fear, can we flatter ourselves that our unpopularity during the last few years has at all diminished. The insularity of our manners, as it is rightly termed, on the one hand, and the gulf dug by caste, creed and custom, on the other, have together made a gap between us and the people which does not seem likely to be bridged over at present. It was long ago pointed out by one of our ablest Indian Statesmen that the direct tendency of our rule was to reduce the people to a dead level of mediocrity from which few or none could hope to emerge, and that we offered no career to the ambitious and adventurous native. Nay, there were not wanting those among ourselves who openly avowed that this was the only safe and wise course for us to pursue. But better and nobler counsels fortunately prevailed; the warning words of Sir Henry Lawrence, that we *must* find some class to stand between us and the people, were listened to in time, and if the chiefs and nobles of the country still fall far short of our ideas of what constitutes a true aristocracy, we have at least shown them, in many ways, that we have no dislike to an aristocracy as such, and that we are ready to give them their fair share in the Government of the country if they will only fit themselves for it.

The great mass of the people, if they do not love us, at any rate, I think, trust us and believe that we mean honestly by them. There is now the ever-present danger expressed in the proverb about too much familiarity breeding contempt, and I sometimes think that in our laudable efforts to raise the people to an equality with ourselves, we are apt to overlook the fact that our rule is essentially one of prestige. But, so long as the giant heart of England beats healthily at home, we may be content to face that and all other dangers incurred in doing our duty by the people of India, satisfied that, even if we fall by the way side, there will be other sons of England ready to take our places, and to carry on to a successful conclusion, though perhaps in a far distant future, the task that England has undertaken in India.

Remarks by the Chairman.

I feel sure that you will all agree with me when I say that we have listened with much interest and pleasure to Colonel Medley's lecture.

Colonel Medley has given us a pictorial sketch of the great changes which have taken place in communications and facilities for travelling, in the army, the civil service, and in social and political life, and has described the effect which those changes have had, and are now producing, in the people of the country. Perhaps an extract which I will read to you from an old despatch of the Court of Directors will, better than any words of mine, enable you to realize the vast gulf between India as it once was and India as it is. I will leave you to imagine how such a despatch would be received now-a-days by His

Excellency the Viceroy and the grave and reverend seniors who constitute his Council.

"We command," the Directors say, "that the Governor and Council take particular care that our younger servants do not launch into expenses beyond their incomes, especially upon their first arrival; and we here lay it down as a standing and positive command, that no writer be allowed to keep a palanquin, horse or chaise, during the term of his writership. That you set apart one day in every quarter of the year, and oftener if you find it necessary, to enquire into the general conduct and behaviour of all our servants below the Council, and enter the result thereof in your diary for our observation."

If I were asked to sum up in a single sentence the distinction between 30 years ago and now, I would say the past was the Age of Authority, the present is the Age of Liberty, or at least of dawning Liberty. The principles of Government are no longer patriarchal, or paternal, or grandmotherly, as some might prefer to call them. The people are no longer compelled like children to swallow the political draughts and doses prescribed for them by higher power. They are being educated themselves to choose, by persuasion and from conviction, what is for their best interests. That is the difference, and it is a difference wide as the poles.

The transition from the one system to the other took place with the transfer of the Government from the Company to the Crown. It was inevitable that the administration of India, when once brought under the direct influence of Parliament, should be inoculated with the leaven of English freedom. The great principles of civil and religious liberty, principles which were not established in England till after centuries of political struggle and which were purchased at the cost of her best and noblest blood—the right of personal security, the right of personal liberty, the right of property, of equality before the law, of religious liberty and toleration, of free discussion and the expression of independent opinion through a press, happily no longer gagged, these principles, which England purchased at such a cost, are now being quietly and unostentatiously applied every day in the ordinary routine of Indian administration. It is to this fact, more than to anything else, that the marvellous changes in social, political and physical life, so graphically described by Colonel Medley, are due. It is this fact which makes the work of the rulers of India a task of daily increasing anxiety, responsibility and difficulty.

Although the people of India have not yet been admitted, and can only be admitted gradually as they are fit, to a direct share in the higher functions of Government, I venture to say that in the main they enjoy a personal freedom and a liberty of action and political development unknown in any country out of Great Britain and America. With the progress of education the time is close at hand when the people must, of necessity, be entrusted with a larger share in the Government of the country. For this the foundation has recently been wisely laid, and the result will probably be even greater progress in the

political life of the people than that which Colonel Medley has described. It would be out of place on this occasion to enter upon any discussion of the principles of local self-government which have been recently enunciated by the Government of India, but I desire personally to express my profound sympathy with them. Some consider this to be a radical movement. I prefer to call it conservative. For in India the true conservative is not the one who blindly resists all change till he is surprised by an explosion of suppressed and pent up forces, but rather he who endeavours to catch the sympathy of the people, to anticipate their legitimate aspirations, and to provide for the growth of their political life step by step instead of leaving them to force their way by revolutionary leaps, through strife and bloodshed.

But here I feel that I am treading on dangerous ground. So I will conclude and ask you to join with me in voting Colonel Medley our cordial thanks for his interesting and valuable lecture.

VI.

SUGGESTIONS ON WHEELED TRANSPORT,

BY

LIEUTENANT A. F. COTTON, B.S.C.

The difficulties of transport experienced in the Afghan campaigns of 1878-80, have naturally turned much attention to that subject.

In organizing a complete system of transport for India, it behoves us first to consider upon what basis it should be constructed.

Hitherto we have followed the custom of the country, employing pack animals almost exclusively, and wherever improvements have been introduced they have been in the direction of alteration of pack-saddle, &c., and the edifice has always continued on the old foundation.

It may fairly be asked—Does our transport only require organization on the old lines to make it efficient, or should we seek for a “new system?”

We think the latter, and would suggest that the transport for an Indian army should be by means of small carts drawn by one pony; pack animals to be on no account used except for first reserve ammunition and for flying columns into hilly districts where roads have not yet been made.

That is to say—wheeled transport assisted by pack animals instead of pack-animals assisted by wheeled transport.

During the latter part of the Afghan war, a good deal of thought was devoted by the authorities to wheeled carriage, and, for the sake of experiment, the writer took a cart from Peshawar to Kabul.

The cart accompanied a convoy, and though the former was not so perfect as to make the trial entirely satisfactory, the working affords some data in considering the matter in hand.

It is as well, perhaps, to give a detailed account here of this experimental march.

The cart was a rough two-wheeled one, constructed for station work by the equipment transport officer at Peshawar.

The harness was very simple, the draught being by means of a breast-strap.

The pony was an average transport animal which would have carried 2 maunds on a pack.

The load, consisting of rope, &c., was sewn up in “chut,” so that it could be quickly transferred to pack-animals in case of the cart breaking down or the road becoming impassable.

The load could not conveniently be weighed before leaving Peshawar, but when this was done at Dakka, the weight of stores proved to be between 5 and 6 maunds. It was then made up to 6 maunds 15 seers, which remained the same throughout the rest of the march except over the Luttabund Kotal.

The object of the experiment was two-fold—to test the practicability of the road for wheels, and to compare the work of a pony in the shafts with that of one under a pack.

Up long and steep inclines the assistance of a leader was called in.

This was easily managed. A pony fitted with an "Ordnance," pack-saddle drew by means of his breast-strap, to the ends of which were attached rope traces that were tied to staples in the shafts.

These leaders were used in certain places between Jamrood and Ali Musjid, and between Fort Battye and Luttabund, 6 marches in all.

The remaining 10 marches, the pony dragged his load by himself, and over the greater part of the 6 difficult stages he worked singly, the leaders being hooked on only at the steep pitches.

The road from Safed Sang to Luttabund had not at the time—February 1880—been completed, and over the crest of Luttabund Kotal, which was extremely rough, being in fact a succession of rocky steps, the load was taken off to save the wheels.

It was of course intended that the grain should be the same as that given to other animals carrying two maunds, but unfortunately the driver could not understand this and was more than once detected issuing extra rations.

The pony reached Kabul in perfect condition and without a gall or rub of any kind, and on the march he was always near the front of the convoy.

Even in a campaign like the Afghan one, with its most trying country, a very large proportion of the carrying might be done by draught. The difficulties of the latter are in no way enormous, in proof of which may be produced the march of the heavy battery from Kandahar to Kabul. The weight of these guns and wagons of course added seriously to the undertaking, yet with slight assistance from pioneers, the battery performed its daily march with the rest of the troops.

On the same day that the experimental cart crossed the Luttabund Kotal *unloaded*, an ordinary "ekka," with mess baggage of the 45th Sikhs, surmounted the difficulty *load and all*. The road was also traversed about a fortnight previously by an ekka which had been procured as a pattern by the Chief of the Transport at Kabul.

If from the experimental cart and from observations in every-day life, it is admitted that an animal can, in a place practicable for wheels, draw three times as much as he can carry, this fact may be considered by far the most important in a comparison of the two systems.

From the first we substitute one animal for three—one thousand for three thousand—and the advantages thus arising are very many.

In fact such a change strikes at the root of the transport difficulty as experienced in Afghanistan, and is felt to begin with the original purchase. One thousand animals, and good ones, can easily be obtained. Three thousand, however, are difficult to find at all; such a large demand raises the price, and it is necessary in the end to admit an inferior class in order to complete the numbers required.

Again with regard to forage and grain. Ask transport officers on the Khyber line whether the relative difficulty of buying one thousand maunds and three thousand was represented on service by those numbers.

Where the former amount could be got of good quality and without exertion on local carriage, the latter was not to be had at all, even by working the Government transport, and in the attempt much was obliged to be passed that was barely fit for food.

Then in the feeding, care, and working of the animals. It would be hard to find any one who thought a single driver could look after three animals as well as he could one, the three being, moreover, pack-animals, or that after a march it was possible for a transport officer to draw rations for and attend to the wants of 900 animals as satisfactorily as 300.

If not discovered for the first time, it was thoroughly proved in the campaign, that great experience is necessary on the part of drivers in charge of pack-animals. At Kabul, during 1880, strenuous endeavors were made to put our transport on an efficient footing. Fresh animals and large quantities of saddlery and other gear were sent up from the base. Acting on our experience, rules were laid down for feeding and treatment. Animals were made over to regiments and placed under the charge of officers assisted by non-commissioned officers and men. Exact methods of loading were drawn up and the troops practised frequently in camp. In short all officers concerned worked their utmost and applied their full intelligence—with what result? After a few day's march there were so many sore backs that some animals had to be worked in that state, the 10 per cent. spare, taken to fill up casualties, having been brought into use. At the same time we could see what it was possible to do with pack-animals, for working alongside us were the hired mules, with which, in the matters of condition and sound backs, we could not for a moment compare. The difference being that the latter were tended by their owners—born muleteers—having the additional spur of personal interest.

This was the state of things quite at the end of our occupation of Kabul, and after we had been two years at the work. Are we not justified, therefore, in thinking that pack-animal transport is of too delicate a nature to be used if we can substitute any other means?

The saddling and loading were found so difficult as almost to amount to an impossibility with attendants not brought up to the work.

The knowledge required for harnessing and loading a cart is but slight in comparison.

Flesh and blood are too delicate to be used unnecessarily on a campaign. The slightest gall or lameness cannot be cured by medicine and the veterinary surgeon only. Time must be allowed for nature to complete the work. A broken cart needs but the workman and the materials. The cart costs nothing for keep while not in work, but animals sick or well must be fed.

To this it may be replied that animals gall and become lame in harness as well as under a pack. True, but they are not so liable under the former circumstances, and returning again to the "three-to-one" principle, it is worse to have 300 animals in hospital than 100.

By far the greatest part of the carrying required by an Army is along the line between itself and its base. The whole of this work can be done on wheels, and not a pack animal should be used. Had an efficient cart-train been in use on the Khyber line, the pack animals could have been marched up to the front without even saddles and would have arrived fresh and ready for expeditions. In reality a large percentage had sore backs and were out of condition by the time they arrived where they were really wanted. Unloaded they would have been almost independent of the difficulties of the road, and could have made a double march to avoid such a place as Pezwan where forage was barely procurable at all.

In organizing a cart transport, the first consideration is—what is to be the draught animal?

Horses large enough for the mounted branches are difficult to procure and should not be taken for transport. Bullocks may be relied upon to form a valuable contingent, and would be largely used on the line of communications, but they are too slow for the baggage of troops.

Mules are so peculiarly suited by their hardiness to pack-work, that it is proposed they should be reserved for that trying duty. Their value came out strongly in the Afghan war. They kept their condition on food which did not nourish other animals, and if they did become low, they recovered more quickly as soon as they got a chance of rest and good food. They also seemed to have a faculty of recovering extra quickly from sore backs.

For an Indian cart transport, ponies seem to be the thing. They are not, like the mule, the result of special breeding in particular districts, but are to be obtained in numbers throughout the country. It is advocated that the ponies should be worked singly.

Draught, by means of more than one animal, necessitates training on the part of both the wagoner and the beasts, but conducting one animal and his cart along the road could be understood almost in the first day by any native, while the pony, if he goes ahead at all, must drag the whole load. With a team, the horses have to do their proper share of the work and the men must understand whether they are doing it.

It will be seen later that leaders are recommended for certain bad parts of the road, and that for this work special ponies and drivers should be set apart.

It is strongly urged that the materials used for the cart should be of the very best. Extra care should be devoted to the selection of the wood, and the iron-work should be thoroughly well made and the best quality of metal used. Both strength and lightness will thus be secured. Within certain limits, money saved is not money gained, and, whatever the cost of our vehicle, if well constructed, it will last longer than ten pack ponies worked and fed as we had to work and feed them in the late campaign.

The cart recommended is a two-wheeled one. Four-wheeled conveyances, though requiring less care in the balance of the load, and inflicting no part of the weight upon the animal, would be much more expensive as well as less manageable in steep and winding places.

It is of great importance that the carts should all be of one size, with interchangeable parts. There should be only one size of bolt used, the screws and nuts being cut with the same die. Care in this would lessen the first expense and would greatly facilitate repairs. Large quantities of all the parts would be sent up to the front and to the posts along the line. A damaged shaft, spoke, or tyre, could thus be replaced while the cart halted for the night.

The pony for which we should look out would be from 13-2 to 14 hands, and the cart should, therefore, be suitable for 13-3. It should have sides and front, and a moveable tail-board. The "Maltese cart" has the advantages of simplicity and lightness, but the load must be tied on to keep it from slipping against the wheels or falling off, and this does away with one of the great advantages of a cart, *viz*: simplicity in loading. The wheels should be as high as possible and should have some simple kind of box for the grease. A brake is needed for hilly countries. There should be a folding leg on one of the shafts to let down and support the load while standing still or when carts are parked. The distance between the wheels would be determined by two considerations. They should be wide enough apart to prevent the cart from turning over readily, and they should not be so far apart as to greatly increase the chance of going over the side of the road in a precipitous place. Springs are at all events worthy of a good trial. It has been determined by experiment that they reduce draught one half, while over rough roads they would save the wheels enormously. The carts would never be required to proceed faster than a walk, and if a spring were so broken that the load had to be taken off, the cart when empty could still travel as fast as the convoy. Of course we must expect such accidents and a complement of spare carts would always be taken.

For the draught-gear attached to the cart, perhaps, that used for farm purposes in England would be the best of any, *viz*:—the back-chain on "travellers," to which are also attached hooks for breeching and collar-chains. Near the points of the shafts would be required staples for the leader's traces.

The load which could be taken with greatest advantage must be decided by experiment, and might be changed occasionally on service by the state of the roads and the condition of the animals. As stated

in another place, the load dragged to Kabul by an ordinary transport pony with a rough cart was over six maunds. It seems probable that, with improved carts, seven or eight maunds would be the working load.

The harness should be as simple as possible, and for trial, the breast-strap is recommended. It was used with success for the experimental cart taken to Kabul. It is of simpler construction and more easily fitted than a collar. There would also be required a head-stall with blinkers and bridle, cart-saddle, breeching, and belly-band. The leader's harness would be the same except a pad in place of the saddle. There would be traces of rope or leather with hooks, and there would be no breeching.

Supposing our experiments with carts and harness to be complete, and that we are finally resolved upon the most suitable pattern, let us take, as an example, the working of the Khyber line of communications from Peshawar to Kabul.

At each post there would be an establishment of as many ponies as were found necessary for the traffic, each pony with his harness fitted and adjusted by the transport officer of the post.

At every place there would be "mistris" and "mochees," probably two of the former and one of the latter. They should be supplied, as before mentioned, with spare component parts of the carts and harness.

300 carts containing commissariat stores for the front are dispatched from Peshawar on the 1st of the month, and the Peshawar ponies take them as far as Jumrood, returning with or without carts. Some empty carts, say 1 per cent, would march in rear of the convoy. The ponies to be changed in the same way as the others.

At Jumrood the carts are parked for the night, inspected by the Jumrood transport officer and mistris, and repairs, if necessary, carried out. According to the nature of the boxes, the grease would have to be renewed every few days.

The loads would not be touched, thus taking advantage of another of the superiorities of wheeled transport. The packages would not arrive at Kabul damaged by frequent loading and unloading; the drivers and animals need not be turned out so early in the morning; and the latter would have no load to support while waiting to start or during a halt or detention on the march.

The carts being all the same size, any 300 ponies from the Jumrood lot can proceed with them next day to Ali Musjid.

Up the long steep hill encountered on this march, the ponies could not drag their carts, if they were loaded to the working point for ground with moderate undulations. A number of leaders, each with his harness and driver, are hooked on and assist until the difficulty is overcome. They would belong to Jumrood, as that is the nearest post to the incline, and after completing the work, they would return on meeting the down convoy.

The number of leaders required would have to be decided by experience, and would be determined by the locality. For a short hill, one would not want as many leaders as carts, for the former could return and help the latter in succession.

The drivers of the leaders would be responsible that their ponies kept their traces tight and really rendered assistance.

On the morning of the 3rd, 300 of the Ali Musjid ponies take the carts to Lundi Khanah, and down the hill, from the "Kotal," the brakes are applied. The Lundi Khana transport officer, on inspecting the carts, finds a wheel so damaged that it cannot be repaired during the night. He exchanges for a wheel off any one of his own spare carts, the broken wheel to be repaired at leisure and take the place of the other.

The experimental cart proceeded via Barikab, and we will presume the convoy takes this route.

From Lundi Khanah to Fort Battye—six marches—leaders would not as a rule be required. However, a few, say 3 per cent, might with advantage accompany the convoy from Barikab to assist any weakly ponies over the deep sandy parts of that long march. The same would be done from Jellalabad to Rozabad.

For the hill up to Safed Sang the leaders would probably be sent from that place.

From Safed Sang to Luttabund leaders would be required for great portions of every march. They would return from halfway with the down-convoy, whose leaders would take over the carts proceeding to Kabul. Thus getting back to their own quarters and officers every night, and preserving the "etappen" principle as much as possible.

The last two marches from Luttabund to Kabul would not require leaders.

At Kabul a number of pony carts were made for the Transport Department, and marvellously efficient they were for the work of mechanics living in a country where wheels are unknown.

The theatre of war, however, is not the place for such work, and difficulty was experienced in obtaining wood, iron and skilled labor. The carts should be constructed by first class workmen in peace time. Probably the cheapest plan would be to have them built in England, where special machinery would be put up for making spokes and bolts, punching holes, &c., thus ensuring perfect uniformity in the component parts. The carts should be stored in India in some point near the railway.

In starting a wheeled transport, there would be a fear of attempts to do the thing very cheaply, an idea which if carried to excess would be fatal to the scheme. Even if we pay Rs. 200 for our cart, the first expense will be less than that of pack animals.

Our great difficulty in Afghanistan was the vast number of our transport animals. Matters were aggravated by want of organization, but large numbers were undoubtedly at the root of our troubles.

A reduction of the numbers to $\frac{1}{2}$, or perhaps to $\frac{1}{3}$, would justify much money and time being devoted to the experiment, and very increased exertion in making a track sufficiently good for wheels.

A wild and mountainous country like Afghanistan presents difficulties in the matter of communications, and also as regards forage. The former stands in the way of wheels, the latter is against numbers.

We must take our choice—provide roads or forage. The latter is very often an impossibility; as the terrible death-rate among our animals in Afghanistan testifies.

For a hasty advance over new ground, pack animals are necessary, just as for certain purposes cavalry are necessary to an army. Cavalry, however, are not used to capture a hill-top, and such a delicate means of transport as the pack animal should not be employed over one single march where carts can go.

Flying columns using pack animals should be in *bona fide* light marching order. As recommended by the Kabul equipment-committee, tents should not be taken, and the force might run the risk of short rations for a day. To be always carrying three days' provisions, with a view to being on the safe side, involves terrible extra wear and tear of transport.

Camels are a necessity to the Arab or Afghan who has neither money to make roads or the idea of combination to obtain capital, but the same arguments do not apply to a great civilized nation with ample funds at its disposal.

What should we think of a string of pack horses on an English turnpike road? Yet camels and pack mules are in ordinary use by us on the first rate roads of India.

The foregoing ideas have been carefully put forward as mere suggestions. They have yet to be tried in the field, and without that severe test, no opinion can be accepted as the most weighty. We can, however, give the system a fair trial even in peace.

There is, for instance, the annual migration to the hills of troops from Amballa. Carts might be used for the baggage; and an officer appointed to accompany them, and make notes of the working. The experiment should be tried on a large scale, say 300 carts at least. The road presents both level and inclines and there are two rivers to cross.

Some experimental carts have already been made at Roorkee for the transport. It remains to experiment with large convoys of these in order to remove the minor difficulties of working, and we may yet see a well *muled* pack-train, perfect as to loading and condition of animals, and looked upon as a *corps elite* only to be employed for special purposes.

WOODCOT, DORKING, }
12th July, 1882. }

VII.

J A P A N .

*Text of a Lecture delivered at the Rooms of the United Service
Institution of India, on the 13th October, 1882.*

BY

DR. J. MURRAY MITCHELL,

The Hon'ble Sir S. C. BAILEY, K.C.S.I., in the Chair.

The subject on which I have the honor to address you is Modern Japan.

The attention of the civilized world has of late been strongly attracted to that country. And no wonder; for not only is Japan a large and important part of the Asiatic continent, with about 35 millions of inhabitants, but its history, in recent years, has been in many ways remarkable.

I do not know of any nation, or age, in which equal progress was made in an equal space of time. The only period that appears really to come up to it in rapidity of change is the generation following the invasion of Asia by Alexander the Great. The Greek language, and to some extent Greek civilization, spread at that time over Western Asia with unexampled rapidity; in 30 years Greek was spoken at the court of every prince from the Egean Sea to the river Indus. Even the Parthian Kings—Turanians—called themselves, "Phil-hellenes," lovers of the Greeks; and they largely adopted at least the forms of Grecian civilization.

The civilization of Europe now seeks to penetrate Asia even to the farthest East; but the great language of culture in modern times is English.

In these days, the nations of Asia generally yield very slowly to foreign influences. Asiatic life and Asiatic thought have stiffened themselves into forms as hard as iron. Thus, China spurns western lore, immensely preferring its own traditional teachings on politics, morality, and religion. Even India reluctantly yields to the instructions of the foreigner, and clings with astonishing tenacity to its ancient ideas and institutions. But of all Asiatic countries, the Empire of Japan had, for fully two hundred years, exhibited the sternest opposition to every thing in the shape of change. No Japanese was permitted to leave his country; any Japanese fisherman or sailor cast by shipwreck on the shores of any other nation, was doomed to death, if he dared to return to his own. Only one country, Holland, was permitted to carry on trade with Japan, and she could send but one ship a year; the Dutch visitors were confined, almost like criminals, to a miserable small spot in the harbour of Nagasaki. One is astonished that for any reason—and

especially for the sake of the wretched, peddling trade they carried on—the Dutch nation could ever have consented to such humiliating treatment, and at the hand of a semi-barbarous people.

But suddenly all this has changed. No metamorphosis recorded in classical mythology was more speedy or complete. The castle that was strongly garrisoned, fortified all round, full of the munitions of war, eager to repel the invader, suddenly capitulates, throws wide its iron gates, and invites the foreigner to enter. I confess to have been one of those who did not believe in the permanence of such sweeping and sudden reforms; and for years I expected that some tremendous reaction would fling the empire back into more complete isolation than ever. But prediction is always hazardous; and the counter-revolution has never come.

It was in 1853 that Commodore Perry, of the United States Navy, to the amazement of the Japanese, sailed into the Bay of Yeddo. He informed them that he expected them to open their country in part to other nations. He prudently gave the Japanese time to consider the subject; sailed away, and returned after several months. No force was exerted, or required. The Japanese consented to open several ports to foreign commerce. A new treaty was formed in 1858, which, among other things, allowed foreign Missionaries to live at certain ports. Things went on quietly till 1868, when a great revolution took place in the government. A system of feudalism which had, for three centuries, controlled the country, was completely overthrown. Till that time, Europe believed that Japan had two equal rulers—one supreme in things civil, the other in things ecclesiastical. It was now discovered that the so-called spiritual ruler, the Mikado, whose dynasty is traceable back to the 6th century B. C., was really the one sovereign; but that his civil authority had been usurped by the Shogun, the head of a house of warriors; and that the latter had dealt with the real monarch as the Mayors of the Palace dealt with the early kings of France—reducing them to ciphers, while ruling in their name. (The usurper was known to Europeans generally by the name of *Tai-kun*; but that word simply means *Great Ruler*, and was a designation unknown in Japan). The Shogun had been almost compelled to enter into friendly relations with foreign powers. A party in the State, weary of his usurped authority, used his intercourse with foreigners as an argument against him, charging him with treason for having acted without the Mikado's consent. This party at first was decidedly reactionary; but on attaining power, they too, by the force of circumstances, were made to become friends of progress. In fact, Japan was tired of its isolation. And now, the pendulum suddenly swung from one extreme to its opposite. European forms of government were studied, and to some extent, imitated. Separate departments of administration were set up. Foreigners were called to aid in the management of these;—Englishmen were employed to reconstruct the navy, the financial, and public works departments; Americans had the chief charge of education; Germans, of the medical schools; and Frenchmen, of military affairs.

You are ready to characterise these as vast improvements on the *ancien régime*. They are so; but there is still great room for reform. The government has become bureaucratic, without ceasing to be autocratic. It is irresponsible. The Senate (Genro-in, *i. e.*, company of elders) simply considers and reports on measures introduced by the ministers. Parliament has no real control. Representative government has been demanded by many; but there is no sign of its coming. Even the right of petition is refused. The Government is a paternal despotism;* but it is too despotic, and too paternal. It tries to do everything for the people. Mines are opened by Government; all great industrial works are carried on by it. Government trades, and the private merchant has no chance. Thus, the Railways; the Mitsu Bishi Steam ship company; cotton mills; woollen manufactures; paper mills; ship yards; printing; bookbinding; type-founding;—all these forms of industry are in the hands of Government and no private parties can compete with it. Yet Government loses on almost every transaction. The people have to “grin and bear it.”; they have the privilege of paying the taxes, and hoping for better days†. Further, the press laws are exceedingly severe; suspension, fine, and imprisonment for very innocent articles are frequent. Extravagance is another fault of the Government. It is anxious that Japan should take its place among the foremost nations of the world. It, therefore, maintains at enormous expense, showy embassies and consulates in Europe and America. A great navy has been formed and a still greater army—one hardly knows why; but the Japanese say it is to fight China and Russia, when required. Of public departments, the Postal and Telegraph Departments are among the most useful and best managed. The Money-order and Savings Bank sections of these are had recourse to by great numbers. On the whole, it is a great pity that the Japanese have shown so little economy in administration; the rock ahead in their case is a financial one; if they can avoid *that*, all may yet be well.

But Japan is not a rich country, the mines of gold and silver of which old travellers made mention, if not mainly fabulous, have been pretty much exhausted. It has, however, extensive mines of coal and copper. Silver‡ and gold are exported in small quantities; but the great articles of commerce produced in Japan are tea, silk and coal, the last being sent to China. One of the chief productions, but seldom exported, is rice. I was astonished to find that milk was never used as food. Cattle are few; and sheep can hardly be kept alive. Agriculture is not in an advanced state; the fields are frequently cropped, and although carefully manured, seem, like the people themselves, overtaxed. There is still much waste land in the country. Indeed it has been estimated that hardly more than one fifth is under tillage. Much of the higher ground, though not available for rice, might certainly be used for wheat.

* The New Constitution (1869) declares the Mikado absolute. He rules through a Supreme Council, which meets on fixed days. Under this is the Legislative Council, which suggests changes, but can decide nothing.—The Government is a despotism, ruling through Bureaucracy.

† The revenue is about 11 millions.

No nation in the East, not even China, was in past days more solicitous regarding education than Japan. A class of literary men existed ages ago; works on history and philosophy were numerous; and those of poetry and fiction were not rare. Block-printing enabled booksellers to multiply them at a cheap rate. Still, education had been confined to the upper class and their military retainers. For women and the lower classes very little was attempted. Nor was the quality of the education satisfactory. Chinese models were extensively followed; and Chinese books chiefly read. This retarded learning; for the Chinese and Japanese languages are widely different both in sounds and written characters. Chinese medicine was taught with its endless refinements and absurdities. Divination was deemed one of the most useful branches of knowledge.

But all this has been changed. In 1868, almost immediately after the full sway of the Emperor was acknowledged, a University was established on a rational basis for the study of Law, Literature and Science, which is attended by about 700 students; and in 1872 an important educational code was issued, which has been of immense service. It declared, among other things, that henceforth education must not be confined to a few, but so diffused that there might not remain "a village with an ignorant family, nor a family with an ignorant member." One cannot but hope well of a country in which such a principle is maintained. No fewer than 53,000 schools were ordered to be set up; but the financial pressure I spoke of has retarded the direct action of Government, which now acts pretty largely through the system of grants-in-aid. The education of girls has been by no means overlooked; they are taught to sew, as well as to read and write. The school books are full of useful information; and the national system of education, although liable to the objection of having too little moral teaching, is on the whole good and efficient. If matters continue as they are, Japan will speedily be one of the best educated countries of the world; perhaps I should say it is so already. One proof of this is the number of newspapers. In 1868, there was not one. At the end of 1879 there were 207. Booksellers abound, and seem to carry on a roaring trade. Every large city has its lending library or libraries. Certainly it was time for the school master to set to work. Take one example of the ignorance that prevailed. It was universally believed that Japan rests on an enormous catfish; and that when the creature wriggles the effect is an earthquake. The fish seems very lively, for earthquakes are almost incessant.

Certain branches of scientific education are admirably taught. The Imperial College of Engineering at Tokio surpassed my highest expectations. Mechanical science in its practical applications is greatly patronized by Government; and under the very able instruction of Principal Dyer and his colleagues, the results have been most satisfactory. Medicine and Surgery are also very well taught; and an enlightened system of the treatment of disease is rapidly extending over the empire. Formerly small pox committed great ravages; but vaccination is now compulsory, and has done much good. Epidemics in Japan are

rare, although cholera sometimes cuts off many. The people, on the whole, are very healthy, and this chiefly, I suppose, in consequence of their comparatively cleanly habits. No country—not Britain or Holland—stands higher than Japan in this respect.

I have as yet said nothing of the appearance of the country. It is a land of hills and valleys, of lakes, and rushing streams. Baron Hübnér compares the lake scenery to that of Scotland. With the exception, however, of the great Fujiama, a volcano more active than Etna or Vesuvius, the hills are neither so high, nor so bleak, as those of my native land. The sky is often exquisitely pure: and nothing could be more magnificent than the sunsets we witnessed. We were too late to see the full beauty of the vegetation; but even in winter, our voyage through the Inland Sea was a thing to be remembered for ever. In summer, the splendour of the flowers and flowering trees is probably not equalled in any other country. There are 150 evergreens; so that even in winter the landscape is gay and smiling. The Japanese have a great sense of elegance and prettiness; and their gardens, their parks, and their artificial ponds, are always very tasteful. The sites and environments of their temples are truly beautiful: their houses are patterns of neatness. The fruits are few and poor. The animals are few. Among the wild, there are no tigers; but there are wolves, bears, and foxes. The birds are neither musical nor beautiful. To make up, the mosquitoes are universal, and very bloodthirsty.

In regard to the arts, I do not know that, with the exception of mechanical engineering, improvement has recently taken place. Indeed, several of them had already attained a high degree of perfection. I doubt whether any nation rivals them in the ingenuity and neatness of their carpentry. Their blacksmiths too are excellent workmen. The distinction between liberal and mechanical arts scarcely applies to Japan. Their common work easily assumes artistic forms. Their bronzes, their enamels, their pottery and porcelain, their ivory work and lacquer ware, their textile work and embroideries, are all excellent. At the Vienna exhibition, the manufactures and artistic productions of Japan stood highest among those of Asiatic nations—higher even, than those of India.

In painting they have never risen to high imaginative art. They have no Raphael or Leonardo da Vinci. Moreover they entirely lack the knowledge of perspective. But they imitate certain natural objects—flowers especially—with infinite skill and taste. They produce great effects with little pains. A few strokes, evidently dashed off with a free hand, and you have a picture full of life and action. But they seem easily to run into the grotesque in representing the human form. In fact they are a grotesque people,—having no pretensions to physical beauty; and when they draw the human figure they always wrap it up in voluminous garments, as if conscious of its want of grace. In architecture they do not greatly excel. I never saw any high imposing building in Japan. The reason may be that, in a land so subject to violent earthquakes, they cannot venture to rear buildings of any considerable height. Thus, all the rooms in the vast palace at Kioto are on the

ground floor. Yet though not grand, many of their buildings are very beautiful. Many of the Buddhist temples are gorgeously ornamented; yet, with all the warmth of the coloring, the controlling power of a cultivated taste is seldom or never wanting.

The Japanese are equal to any people in point of politeness. When friend meets friend, their complicated and elaborate bowings and obeisances are quite laughable to a foreigner. They are very strong on matters of etiquette; to violate the fixed forms of social life is a dreadful offence. You must live in the polite way, and die in the polite way; even if you commit suicide, you must do it in the polite way.

The people are small and slight. Many of their habits are quite opposite to those of other nations. Thus, the carpenter draws the plane to him instead of pushing it from him. When they mount a horse, they get up on the horse's right side, not the left. The dress of mourners is white. In building a house they first erect the roof and build downwards. They put the horse's head where the tail should be—that is, in stabling, they put the heads of the animals towards the door. I saw one day a whole array of ponies arranged with their heads towards the street, and I thought the poor things enjoyed the sight of the great world before them. The horses are shod with straw; and the oxen too; they carry sets of shoes with them. Ladies try to make themselves ugly. Married ladies blacken their teeth, and ought to pull out their eye-brows. Lastly, you cannot pay a greater compliment to a woman above 30 than by addressing her thus—"Old lady, what is your age?" Tell her she is very old; and she bows to the very ground as she thanks you.

Japan is full of contrasts. The old and the new go hand in hand. Customs that might have prevailed before the deluge stand side by side with brand-new English inventions or Yankee notions. Some one has said that the Japanese are like a newly hatched, lively chicken, rushing about with a bit of the shell sticking to its back. Mention not this to the sensitive Japanese! They are proud of their improvements—their English dress—and their newly acquired English tongue. But their English, though not so vastly funny as the pigeon-English of the Chinese, is sometimes droll enough. English sign-boards often appear, which may be intelligible to the Japanese but rather puzzle the Englishman. Thus "Horse shoe-maker imstracted by French horse-leech," rather requires interpretation. So does "Hatter native gountry"; though we could, I suppose, get Japanese *topees* from him. Nobody, however, can misunderstand the following. "If you want sell watch, I will buy; if you want buy watch, I will sell. Yes, Sir, we will, all will. Come at my shop. Watchmaker."

But I must now proceed to speak of the subject of religion.

The Japanese are often described as being constitutionally a non-religious people. The original faith is called Shintoism; it is mainly the worship of spirits, particularly the spirits of ancestors and departed heroes. Shintoism uses no images. In every temple a mirror is suspended, which is regarded as an emblem of purity. There are hardly any definite doctrines or rites; purity of heart, purity of body, observance of holy

days, and pilgrimages to holy places, are nearly all that is inculcated. Fruits, fish, and cooked food are offered to the spirits. Religion gets mixed with jollity. When taxed with having no moral precepts, the priests reply—"A wicked people like the Chinese require to be drilled in their duty; but the Japanese are good by nature." This system—if a thing so indefinite can be called a system—was ill fitted to stand before a clear-cut well-defined religion like Buddhism, which travelled to Japan by way of China and Corea.

Buddhism has branched out into at least 8 sects. In general its worship is a complicated, dazzling ceremonialism. In its teachings it professes to give very full account of the unseen world. The recitation of prayers is endless. By far the most remarkable sect of Buddhism is the Shin Shiu or New Sect, which arose about 700 years ago. It is Buddhism greatly simplified. Of its origin we cannot speak with certainty; if its founder thought it out for himself, as his followers assert he did, he must have been a very extraordinary man,—almost as much so as Shakya Muni (Buddha) himself. The old asceticism of Buddhism it rejects; the very priests can marry. So, the doctrine of the sacredness of all life is discarded, and even the priests may eat fish and flesh. Again, instead of a host of Buddhas and Bodhisatwas being revered, they fix their minds on one being called Amita Buddha, "the infinite Buddha." The priests in Japan eagerly assured me that their ideas of Amita Buddha were the same as ours regarding God. But that assertion is not correct; they do not believe in Amita as either Creator, or in any full sense, Ruler. Nirwāna they explain to be eternal happiness, not extinction of being. It is to be attained by *ta-riki*, i.e. the strength of another, viz., Amita Buddha. Faith on him secures salvation. Amita's earnest desire is to save all men, even the lowest and the vilest. This is a singular approach to the Christian doctrine of salvation by grace not by works. Farther, one of their highest ecclesiastics assured me that the doctrine of Atonement is inculcated in some of their standard books; but when I asked for quotations in support of the assertion, they were not furnished, and I think the functionary I refer to must have been mistaken. This sect of Buddhists does not imitate the others by reciting interminable prayers; they do not build their temples in remote places; they preach extensively. They earnestly seek to extend their sect and have sent out Missions even to China. It is followed in Japan chiefly by rich merchants and out-castes. It is easy to see why the latter class adopt it; it does not scornfully repel them as the other sects do. Why the rich accept it is a more difficult question; I am loth to say that it is because they think that, faith being all sufficient, they may without fear live an easy, luxurious life.

After the revolution in 1868 Shintoism revived in some degree under the patronage of the Court, and Buddhism greatly declined. On the whole, however, Shintoism loses nearly as much as Buddhism, though it is said that 700 Buddhist temples have been given up to secular uses during the last 12 years. Meantime, Confucianism has gained, or seemed to gain, among the upper and more educated classes. It is a morality, not properly a religion; of the gods and a future life, Confucius

said nothing. But the professed Confucianism of these men is in reality indifferentism, if not absolute scepticism. A high Japanese expressed a very general feeling when he said, "Religion is very good for my wife and children ; but I do not concern myself about it."

I apprehend there is considerable danger that this indifferentism will extend among the upper classes. Shintoism is too negative to last ; and Buddhism will not co-exist with that modern enlightenment which Japan so eagerly desires. The great contest will be between unbelief and Christianity : though I admit that, if the reformed Buddhism I mentioned will somewhat alter its teaching and speak of God instead of Amita Buddha, it may continue to exist, if not to flourish. Still, the inconsistency of its doctrines with those of Shakyamuni is too glaring to be overlooked ; and the Japanese Buddhists cannot base their teachings on the authority of the famous Indian sage.

Christianity has been preached for about 11 years past with great zeal in Japan, by European and American Missionaries. The New Testament has been translated and published both in the Japanese and Roman character. The translation of the Old Testament will be ready by and by. The circulation of the Christian Scriptures has been very large ; a letter which lately reached me from Japan mentions that in one day 500 copies of the Gospels were sold in the streets in Kioto, and 700 in one day at Tokio. These things will show that at least the curiosity of the Japanese has been aroused in regard to this new religion. Large numbers can be easily collected who will listen quietly to Christian preaching. The Protestant converts, after about 11 years, are fully 5000 ; the Russians and the Roman Catholics both claim to have a still larger number of proselytes. More than one influential native paper has said that, if Christianity continue to advance as it has been doing, it must soon become the prevalent religion of Japan. Of the Japanese Christians with whom I came in contact I formed a high opinion. They certainly will labour with unflagging zeal for the extension of that religion on which, as they believe, must depend their own happiness and that of their beloved country. Let me just add that it does not follow that, in its mere outward forms, the Christianity of Europe and America will reappear in Japan. The form of worship, I believe, will be, in one sense, national, while the creed will be accordant, in all essentials, with the traditional faith of Christendom.*

But it is time that I should release my audience, even if they would lengthen out the exemplary patience they have hitherto exhibited. As I said already, if Japan can practise economy and avoid the financial rock a-head, she may yet become the envy of all other Eastern nations. Her ambition is to be "the Britain of Asia" ; and towards that high aim she will persistently struggle. It is not to be expected that she will commit no mistakes ; still, I trust, there will be progress on the whole.

* I do not consider the appointment by Government of Sunday as a day of rest on which all public offices are understood to be closed, as being any proof of an inclination of the high officials to Christianity ; it is apparently only another instance of the adoption of Western civilization and its habits.

The spectacle is beyond measure striking. Here is an Asiatic nation, neither Aryan nor Shemitic in blood, but Turanian, and therefore (if the common view be correct), of no high mental gifts, yet anxiously labouring to follow in the footsteps of the most highly civilized communities of the world.

It appears not unlikely that Japan may outstrip even India in the race of progress. The two countries are in many respects unlike each other. Undoubtedly, India has an immense advantage in the large infusion of Aryan blood in her veins. The intellect of the Japanese is deficient in depth and power, and, in some things, almost childish. On the other hand, Japan is not hampered by the institution of caste, which still holds this country in fetters of iron. Farther, woman in Japan obtains, if not her legitimate place, yet a far higher place than in Bengal, and higher than in any part of India.

On the whole then, the countries are not unequally matched. Which will win the race?

India has too quietly assumed that precedence and pre-eminence among Asiatic races are hers by birthright. Recent investigations, however, tend to show that, in the earlier ages, Turanian races marched in the van of progress; and history often repeats itself. It seems at present possible that a Turanian people in the most distant East may outstrip not only the Shemitic, but the more lagging members of the Aryan race. As the Roman poet says, *Palmarum qui meruit ferat. Let him bear the palm who has deserved it.* If Japan continue to advance as she has lately done, she will deserve the admiration of Asia and the world. Her example is even already influential; it has been referred to by the more enlightened Chinese statesmen as worthy, at least in some things, of imitation.

And yet I confess I look to the future of Japan with considerable apprehension. She trusts too much to mere intellectual and material progress. Religion has far too little hold on the people, to ensure great advancement. The higher classes generally are Agnostics. There is in Japan very little sense of a living, personal God. Where religion, or rather superstition, exists, it is often *immoral*. Immorality indeed, is more systematically legalized in Japan than in any other country under heaven. Purely intellectual education will do little to correct this dreadful evil; the fruit that grows from such education has a fair outside but is all rottenness within. Still I do not despond. Shintoism is dead, and Buddhism is dying; but Christianity is making steady progress; and she—as all history attests—has ample power to regenerate and raise the fallen, whether they be individuals or communities.

VIII.

THE TURKISTAN DETACHMENT IN THE AKHAL-TEPE
EXPEDITION OF 1880,BY
CAPT. E. R. ELLES, R.A.*Précis from the Official Account of the march, published in the
Voyeny Sbornik by Captain Muravtsev.*

The following short account may prove of interest to the readers of the "United Service Journal," not only on account of the difficulties of the route, but also as the latest instance of the use of "Mounted Infantry"—a subject which has given rise to considerable discussion lately. The very successful issue of this march, as shown by the wonderfully small percentage of sick on its termination, and by the comparatively small number of casualties amongst the camels, considering that there was water only twice in 337 miles, prove the energy, skill and ability with which it was conducted, no less than the careful preparation and foresight which contributed so much to its ultimate success. Success was chiefly due to the experience gained from disastrous failures on previous occasions.

In the end of the year 1880, it was determined to send a detachment of the Amu-Darya division of the Turkistan troops into the Akhal-Tepe oasis to co-operate with the force under General Scobelev.

Colonel Kuropatkin, whose name is well known to us from the operations round Plevna, a most energetic and rising officer, was appointed to the command, and took charge of the detachment on the 10th November 1880, at Fort Petro-Alexandrovski.

On the 12th November, the detachment, composed as under, started from the Fort.

	Officers	Men.	
		Combt.	Non-Combt.
1st Company, 13th Turkistan Line Battalion	3	161	10
3rd Company, 5th Turkistan Line Battalion	4	142	8
3rd Division, 4th Battery, 1st Turkistan Artillery Brigade (Mountain Guns)	1	30	5
1st Sotnia, 1st Cavalry Regiment of Orenberg Cossacks	6	137	5
Rocket Section of do. do.	1	22	0
5th Sotnia, 2nd Cavalry Regiment of Ural Cossacks	5	136	5
with 2 guns and 2 rocket tubes.			

This force was joined on the 17th November at Chagil by the Rifle Company of the 13th Turkistan Line Battery (3 officers and 150 men).

	Staff Officers.	Officers.	Under Officers.	Musicians.	Men.	Non-Combatants.	Officers' Servants.	Total.
Detachment Staff	2	8	2		6	1	4	23
3 Companies Infy...		12	48	26	367	12	7	472
5th Sotnia, Ural Cossacks	2	4	10	3	128	1		148
1st Sotnia, Orenberg Cossacks	1	6	15	3	114	5		144
Rocket Division ...		2	2		22			26
Mountn. Batty. do...		1			35			36
TOTAL, ...	5	33	77	32	672	19	11	849

The native followers with this detachment were:—4 Guides, 15 Jigits and 153 drivers to 900 camels. The camels were distributed as under:—Infantry 465; Staff and natives 60; Cossacks 300; Artillery 50; Hospital 18; Major Ephremov (in charge transport) 4; spare 3.

On the 18th November, Khorunji, Sub-Lieutenant Stetzenko of the Taman Cavalry Regiment of Kuban Cossacks, arrived at the camp of the detachment; he had been dispatched by General Scobeleff, commanding the troops of the Trans-Caspian Division, to meet the Turkistan detachment, and to serve them as guide to the Akhal-Tepe oasis, when he had explored the proposed route. He left Kizil Arvat on the 4th November and travelled via Igda, Urtakuin and Kizil-Kuyus wells; missing the detachment in some curious way, he reached Petro-Alexandrovski on the evening of the 15th, having accomplished the distance from Kizil Arvat, about 455 miles, in 11 days. On reaching the Fort he heard that the detachment had marched on the 12th, and following them, came up to them on the 18th, in their camp on Lake Kizil Chagilda. The information he gave in his report was very valuable, and owing to it, the detachment, on reaching Igda, marched on Bami instead of on Kizil Arvat, as the latter route was waterless.

On the 20th November all arrangements had been completed, including those for water supply. The detachment took with them 231 "bochenoks" (wooden kgs fitted with slings), and 484 "tursuks" (mussuks), the former averaged 8 vedros= $21\frac{1}{2}$ Gallons, (1 Vedro=2·707 Gallons), the latter 3 vedros=8 gallons.

These were allotted as follows :—

- i—For 3 companies Infantry, 474 men and 22 horses—125 "bochenoks" and 41 "tursuks."
- ii—For 2 Sotnias and the Rocket Division, numbering 314 men and 336 horses—79 "bochenoks" and 384 "tursuks."
- iii—For the Artillery Division, 36 men and 14 horses—10 "bochenoks" and 16 "tursuks."
- iv—For Staff, natives attached, and in reserve—15 "bochenoks" and 18 "tursuks."
- v—For hospital—2 "bochenoks," and for transport drivers—25 "tursuks."

The provisioning of the detachment was as follows:—Forage (barley) for Cavalry and Artillery for 21 days from Lake Chagilda. Provisions for the whole detachment for 30 days; live stock, 21 bullocks and 221 sheep. Tea and sugar were taken for 4 months. A large quantity of essence of vinegar, and dried cabbage, was also taken, and pressed sesamum for camels' food. The tentage for the troops consisted of the nomad "yurtas." The men were also well equipped with warm clothing, posteens, wadded coats, bedding, felts, &c. The Infantry of the detachment were mounted on camels, two men to one camel, in order to facilitate rapid movement over the sandy desert to be traversed, consisting for the most part of loose shifting sand. A train of 900 camels—considering the amount of necessaries required for the detachment and that the infantry were mounted—does not seem a very large number. On the other hand it may be said that 3 companies and 2 sotnias would be quite lost in such a train and become a mere baggage guard. But the use of such a large train was justified by the end in view, *viz* :—to join General Scobelev with the largest possible number of men and horses in good health and fit for immediate action, as soon as possible.

The detachment marched in two bodies at intervals of a day; the 1st portion comprised the Cavalry and Rocket division; the 2nd, the Infantry and guns. The reason for this was the scarcity of water at the wells of Shakh-Senem, Giaour-Kila and Kizil-Cha-Kuyus. On the 21st November the leading échelon started from Lake Kizil Chagilda at 8 A.M., and reached the wells of Kizil-Cha-Kuyus at 9 P.M., having marched 60 versts, or 40 miles, the transport arriving at 3 A.M., on 22nd. The next march on to Shakh-Senem was put off to the 23rd. Marched to to Shekh-Senem 25 versts or 16 miles—2 wells, water in one bad but drinkable in case of necessity, that in the other brackish and undrinkable.

24th.—Train of 1st échelon marched at 7-30 ; Cavalry and Staff at 8 A.M. Train in 3 lines guarded by $\frac{1}{2}$ sotnia of Cossacks reached the wells of Giaour-Kila at 4 P.M., Cavalry at 2 P.M. Distance 30 versts or 20 miles. There are 2 wells, 49 to 56 feet deep, with little water and saltish. A small detachment of Cossacks, belonging to the Amu-Darya Exploring Expedition, were stationed here. In addition to the wells, a large quantity of rain water had been collected in a pit. All the mussuks, &c., were filled up from this.

25th.—Marched at 7 A.M., and up to 6 P.M. travelled 20 miles ; halted 4 hours and watered men and horses from the mussuks. Camels fed with sesamum. Started again at 10 P.M., and marched until 2 A.M., on 26th. The night was so dark that the Ural Sotnia was sent and ordered to leave posts of 4 men every $\frac{1}{4}$ of an hour along the road, with instructions to maintain a slow fire until the train came up with them.

26th.—The column marched on in this manner until 6 A. M., when they again halted at a waterless spot ; having travelled 19 miles in the night, or in all 39 miles. The last camels did not come in until 2 P. M. ; these were left to halt for 2 hours. The remainder of the detachment, cavalry and train, marched at 2 P. M. At 12 miles, or 51 from Giaour-Kila, passed the Daudir wells. The water in one was saltish, but fit for cooking, in the other bitter, but the horses drank freely. The sotnias merely halted to water, the train proceeding on. At a point 12 miles from Daudir, they halted for the night at a waterless point ; cavalry at 11-30 P. M., and train considerably later, the tail coming in at 6 A. M. on 27th. Length of march 24 miles.

27th.—At 10 A. M. the Commander, with a section of Cossacks, went forward to inspect the Urtakui wells and ascertain the possibility of digging new ones ; the échelon followed. He reached at 3 P. M. distance 12 miles over shifting sand. At Urtakui were 2 wells with slightly saltish water, one was cleared out by the Cossacks with entrenching tools. Train and remainder of the Cossacks reached at 10 P. M.

28th.—The first échelon halted. In order to water the camels and enable the water-supply to be filled up, the digging of 4 new wells was commenced. At 6 P. M., the 2nd échelon arrived, and immediately on arrival each company commenced to dig a new well for itself ; these were finished by midnight and were 12 to 14 feet deep ; the water in one was rather saltish.

29th.—A second day's halt. In the morning a 10th well was dug for the camel drivers. On verifying the number of camels, the casualties since starting were as follows ;—On leaving Petro Alexandrovski, there were 900 camels, and at Chagil 150 more were obtained from Turcomans to make up for desertions. On the whole route to Urtakui 27 died, 118 were taken off by drivers deserting, 18 were abandoned as useless, total 163, thus leaving 887 at Urtakui with 153 drivers.

30th.—Both échelons left Urtakui. Infantry at 9 A.M., cavalry at 10 A.M. The detachment took water as under for the waterless marches up to Igda wells.

3 Companies ...	...	...	1,103 vedros = 2,985 gallons.
Ural Sotnia ...	...	...	762 " 2,062 "
Orenberg „ ...	...	...	468 " 1,266 "
Artillery Division ...	...	...	122 " 330 "
			<hr/>
			2,455 6,643
			<hr/>

The detachment halted at 8-30 P.M., for the night at a waterless point, having marched 27 miles.

1st December.—Train and head of column marched at 7 A.M., cavalry at 10 A.M.; halted for the night at 8-30 P.M., at a waterless spot, having marched 29 miles. On this march the natives who had been sent on to the Igda wells were met returning; they reported only 2 of the wells not blocked up; leave water fresh. The Commander at once sent on 40 Cossacks with entrenching tools to seize the wells and clear out those requiring it; from the halting place to Igda was about 13 miles. Plenty of forage for horses (Juzan) along this march.

2nd.—At 8-30 the Cavalry started, and at 9 the Infantry and train.

The whole distance from Urtakui to Igda is 69 miles, chiefly over soft sand. Two open wells were found, 2 more had been cleared by the Cossacks, and the remaining seven were cleared by the Infantry.

These wells lie in the old bed of the Amu; the water is rather saltier than at Urtakui. The route from Urtakui to Igda was found easier than was expected, as the distance was much shorter than that shown on the map.

3rd.—Halt. Owing to the scarcity of water, all the infantry camels were sent to water at the Lesser Igda wells, 2 miles further on, 6 in number, but 5 filled up; workmen were sent to clear them out.

The health of the detachment was excellent—1 sick and 11 weakly men—the latter, however, fit for light duties. From here the route on Bami was chosen, as shorter and easier travelling than that on Kizil-Arvat which is through heavy sand.

4th.—Infantry and train started at 8 A.M., and cavalry at 8-45 A.M. The detachment halted for the night at 11-30 P.M., at a waterless point, having marched 32½ miles.

5th.—In case of an unexpected meeting with Turcomans, traces of whom had been seen on the previous evening, a fresh order of march was adopted.*

A company of Infantry moved at the head of the first échelon composed of the infantry; this company sent on an advanced guard and patrols to the front and flanks. Then followed the Artillery Division and the greater part of the Infantry train, one infantry man being told off to look after every 15 camels, as guard.

* The normal method of marching adopted by the Russians in marching on the steppes—vide Kostenko's Turkistan.

The 2nd company came in the centre of the échelon, forming the main body and chief escort of the train; this company also sent out flank patrols, 2 on each side, at a distance of 200 to 300 paces from the road. At the tail of the train came the 3rd company which only furnished a rear guard. A few Cossacks were attached, 4 men being sent out as flank patrols, 500 paces on each side of the road, and 3 men at the head of the advance guard.

The 2nd échelon, immediately following the 1st, was composed of the cavalry and its train, with a detachment at the head of the column and one as rear guard; on either side, at a distance of 1 to 2 versts, ($\frac{2}{3}$ to $1\frac{1}{3}$ miles) another detachment as flankers: One Cossack was told off to every 25 camels as escort. The remaining sotnia and rocket division formed the main body, ready to move whenever required and could march either at the head, centre, or rear. When camped, the detachment formed a square, each sotnia and company furnishing a section for picket duty; the guns were loaded with care and rocket tubes charged. The sections on duty each furnished 2 posts forming a chain of sentries round the camp. At dawn the camels were driven out of the square to graze and the chain of posts pushed further out to cover them. Before dawn the pickets were not allowed to lie down but were kept under arms until daylight. Leaving the camp at 10-15, the Commander pushed on past the train, with the Orenberg Sotnia and rockets, to the Sansiz wells. They reached them at 12-45, after a march of $10\frac{1}{2}$ miles. There are 20 wells, but only 6 had water; one of these was slightly salt, but fit to drink at a pinch, the others brackish and unwholesome. The depth of the wells up to 70 feet. The whole detachment came in by 2 P. M.

6th.—The detachment moved from the Sansiz wells in the same order as on the previous day. Infantry at 2 A. M., Cavalry at 3 A. M. They marched without halting until 3-45, doing 31 miles. Camp waterless and called "Devlyet Tapiz." Close to the camp, the flank patrol came on Turcoman Kibitkas (huts), abandoned on the advance of the Turkistan detachment.

On reaching this camp the amount of water in the skins was found to be:—

Infantry...	...	2,339	gallons.	
Orenberg Sotnia	...	584	"	
Ural	" ...	1,110	"	
After serving out water for the night there remained:—				
Infantry...	...	996	gallons.	
Orenberg Sotnia	...	346	"	{ Received 270 gallons from In- fantry.
Ural	" ...	346	"	

7th.—At 9-30 A. M., the head of the column started, the order being as before. At 12 miles, they passed the wells of Nyaz, 7 in number, but all filled up. On the Commander reaching here with the cavalry, in advance of the train, a large column, in which cattle and horsemen were distinguished, was seen in the distance

Patrols were sent out and soon ascertained that the column was composed of transport animals sent out from Bami with water to meet the detachment. The Commander met the column 2 miles beyond Nyaz and found a company of the Apsheran Regiment with 100 barrels of water. This water was sent out at Colonel Kuropatkin's request; as he had sent on a native from Igda to Bami with information as to the probable date of his arrival. This column was reversed, and after proceeding 6 miles, Colonel Kuropatkin halted for the night, being joined by his detachment at 6-30 P.M. The total march was 20 miles. The water from 800 to 950 gallons brought out was all given to the Sotnias, as the infantry did not require it, having still 1028 gallons or sufficient for another 48 hours. It was decided to expend all the remaining water on the 8th.

8th.—From Nyaz to Bami is 14 miles, and the detachment reached at 3 P.M., and camped round the Fort. They were met by General Petrusevitch and staff, 3 miles out.

Of the whole route, the part between Igda and Bami, 180 miles was the most difficult, lying (except the last 16 miles into Bami), over incessant and very high hills of shifting sand, very difficult to traverse even in winter.

The total distance from Petro-Alexandrovski Fort to Bami was 445 miles, of this the actual desert of 337 miles was traversed in 18 days. The average march for 14 marching days was 24 miles.

Throughout the whole journey the camels were only watered twice. At the Igda wells there were 887 camels; en route to Bami 52 died or were abandoned, leaving 837 on arrival at Bami, of which 17 were considered unserviceable.

The state of health of the detachment was excellent; on arrival there was only one sick and 10 weakly men in the detachment.

The state of the weather during the march was as follows:—

Average Temperature—

At 7 A.M.	...	...	...	30°·7 F.
" 1 P.M.	...	..	...	50° "
" 7 "	...	...	...	38°·75 "
Average daily temperature	...	...	...	39°·8 "

The number of windy days was 5, cloudy 6, rainy 1.

The detachment halted at Bami on the 9th and 10th to refit, take in provisions, and allow the men to wash, and on the 11th marched towards Geok-Tepe.

SIMLA, }
May, 1882. }

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W. E. GOWAN, MAJOR,
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ORIGINAL PAPERS.

I.

THE CAUSES WHICH HAVE LED TO NATIONAL SUCCESS IN WAR.

*Text of a lecture delivered in the Rooms of the United Service
Institution of India, on the 24th October 1882,*

BY

CAPTAIN E. H. H. COLLEN, B.S.C.,
H. E. GENERAL SIR D. M. STEWART, BART., G.C.B., C.I.E.,
in the Chair.

In venturing to present myself before you in this unfamiliar character, I feel that I am liable to have at least two charges made against me. First, for venturing to appear before you at all; secondly, for venturing to follow, even at a distance, a path along which you were led at the beginning of the season by a master of the subject.

As to the first charge, I may perhaps plead 'not guilty,' or transfer it to the shoulders of the Council, who did me the honor of inviting me to appear here. On the second charge, I can only plead extenuating circumstances, in that the investigation of the causes which lead to national military power must ever be of deep interest to those who desire to see their country maintain its great position.

Now, without entering into a lengthy abstract discussion of the causes which have led to national success in war, it may perhaps be said that history teaches us that the motive power of war is much the same now as it has been in the past; that certain moral and physical forces have always been at work in relation to war; that these have varied in intensity at different periods; and that, although there is a line of demarcation which divides physical and material causes from those which we call moral or mental, each class has had a powerful influence on all military successes, whether in the remote past or in the present. In the physical class of causes we may place those qualities of bodily strength, endurance, courage, and the development of weapons, which contribute so largely to efficiency in war; while among the moral causes are those all-powerful forces of national history, religion, government, education, and organisation. If we had time, it would be possible, I think, to trace the steps by which the physical have been gradually dominated by the moral causes; to see how the higher qualities have by degrees been called into play in the tragedy of war, until they have rendered the physical forces, still most powerful, their servants rather than their masters.

But although we may properly say that in the earliest days, the moral were over-shadowed by the physical forces, yet even in the times when history appears almost legendary, examples are not wanting of these moral forces. It was by organisation based on territorial division that Sesostris was able to put into the field the army with which he overran vast countries; and in the early military system of the Persians—successors of the Egyptians in that martial prowess which, perhaps, can hardly be said to exist in their descendants,—we trace signs of an organisation, not differing greatly from that of our own days. The division of the empire into military provinces, the separation of the troops into garrison and territorial forces, and other details, present features remarkably like the systems of our own times; while the measures taken in the event of invasion, for the reinforcement of a standing army by provincial reserves, and the levy *en masse*, bear a curious resemblance to the Landwehr and Landsturm forces of one of the great military nations of the present day. And here, too, history tells us of the causes which led to the defeat of the once courageous and enduring Persians by the warriors of Greece. How years of easy victory and of luxury, penetrated the soul of the people and the army, until at last the powerful organisation fell to pieces at the touch of a nation whose qualities were European rather than Oriental.

I would now ask you to glance briefly at certain points in the characters of the Greek and Roman armies. Physical training, military exercises, endurance, and courage, all tended to make the Greeks a nation of soldiers. And in their organisation and administration, which latter appears to have aimed at freeing the General commanding from the burden of details,—going so far as the appointment of distinct Officers responsible for supply and finance,—we see an example, even in those early times, of the value of effective military administration. But it is in the astounding conquests of Alexander the Great that we must look for the highest example of pre-eminence in organisation. His grand phalanx, whose total strength and constitution were not dissimilar to that of the modern army corps, was the crowning stone of the military edifice of those days. With a tactical system suited to the arms, and to the hardy Macedonians who used them; with good systems for supply and transport, and for procuring intelligence; with units of command complete in themselves, but subjected to the control of one mind; with an exact but expansive system of administration, Alexander the Great was able to do more than had ever been attempted before, or probably will be ever attempted again.

We can only spare a few moments to consider the causes which led to the success of Rome. The great strength of the Roman system consisted, I venture to think, in liability to military service, in the physical training of the nation and of the army, in the tactical improvement by the formation of the legion as a unit of military force of great mobility, and complete in itself; and that the army was at first composed of the nation, rather than of a mere body of mercenary soldiers.

Now, although we cannot attempt to trace at any length the decay of the military spirit of the Roman Empire, I think it may be said that the separation of the people from the army, the recruitment of this standing army from the lower classes or from distant provinces; the fact that the nobles no longer claimed it as their honorable right to serve in the Roman legion, were some of the principal causes leading to the breaking up of that army, which was no longer a national one. Pedantry and routine succeeded valor and organisation; and in tactics, complicated formations were substituted for the simple order of battle, which was one of the great features of the earlier Roman military system.

With the overthrow of the Roman Empire we pass into a different era; and although in the history of the invading Northmen, or in after years, chivalrous displays of courage, may attract the romancist or the poet, the student of war finds but little to interest him.

Now, I should exhaust your patience were I to ask you to consider transient military successes, which have not fixed themselves permanently in history. And, therefore, although there are many nations which have achieved passing success in war; although it might be specially interesting to consider, for example, the history and characteristics of the Turkish Army, and to discuss whether it is really possible to raise it to a high standard as a modern weapon, I think we must confine ourselves to some leading examples among the nations of Europe; and, with your permission, I would propose that these examples should be afforded by the victories and reverses of France, Germany, and England.

In trying to trace the causes which have led France to her position among military nations, we may, perhaps, start with the fact that the early bravery of the Gauls, intermingled with that of the Frank race, and that their resulting military spirit, has pervaded the history of France from the earliest date up to the present day.

In the feudal times, war educated the nobles, but the peasantry and middle class, the great material of armies, were pressed down; even martial games were discouraged, and there was complete division between the classes. The establishment of the *compagnies d'ordonnance* by Charles VII marked the change from the feudal to the standing system; the feudal armies disappeared, and mercenaries took their places. Richelieu tried to effect reforms, but these hardly struggled above the surface, and a military system scarcely existed. Such then was the state of things when Louvois appeared on the scene, and in 1662 became Secretary of State. He first turned his attention to the reform of the military administration, in organisation, and in every detail of an army; by his remarkable powers he created the system which existed up to the time of the Revolution. He found a skeleton army. After 30 years of incessant labour he formed one which fought the most brilliant campaigns in the history of war. The successes which placed France in the foremost position among military nations were due then, to the powerful administration which Louvois created, to the choice of eminent leaders, and to the warlike spirit; but there

was no national army, and when the great administrator had passed away, and the generals were no more, nothing seemed to be left but corruption and confusion of system, and a servile imitation of Prussia.

The revolutionary army of France was created in a state of anarchy. In this army all the impulses of excitement and intelligence were present, but organisation and generalship were wanting; and the general who proclaimed that "the march of the troops must be majestic, and in masses," but who himself declined to march, was only an example of the low point to which military leadership had fallen.

In a period critical with disaster a simple captain of Engineers came to guide the French army into the right path. Under Carnot, as Minister of War, the nation responded to a levy *en masse*, and the amalgamation of the old royal army and the republican army was carried out. Under him France became one vast military workshop. He organised the army into complete brigades and divisions; he remodelled the administration, and while reserving the supreme control of military affairs to himself, he was careful to insist upon a just division of labour. In an administration of 18 months he formed armies which won 27 victories and which took 116 fortresses. He laid the foundation of the modern military power of France, and, I think, we may say that, as a military administrator, he stands almost without a rival.

If Carnot created a national army, it was Napoleon who reaped the fruits of organisation. One of his first steps was to unite the divisions into army corps, and he introduced numerous improvements in organisation. But with all this there was no permanent system for the maintenance of armies. He centralised everything in his own hands; and when his controlling power was withdrawn, there was no guarantee for the continued existence of the system by which he worked. His power of great combinations, and of striking decisive blows; his great genius both in strategy and tactics, caused him to be looked upon almost as a supernatural being. But he could not communicate his qualities to those who might act for him, and succeed him; and as there was no permanent system, the time arrived when the exhaustion of the nation could no longer respond to the call to glory. After 1815, France temporised with the evils which were apparent; and although some improvements were effected in the organisation and equipment of the army, the army was separated from the country. In the Crimean War, the French Army could only be compared with that of a country in which real military administration and organisation were unknown. The victories of the war of 1859, in the eyes of the world, covered many defects, and it was not until 1866, when the successes attending an army which had been looked upon as a mere militia trained in peace manœuvres, attracted the attention of thoughtful Frenchmen. But the patriotic aims of Marshal Niel, the warning voice of Trochu, the minute and far-seeing report of Stoffel, met with no better fate than usually attends the warnings of those who seek to save individuals or nations from the perils of pride. Confidence in past glories, improvements in *matériel* accepted as

covering faulty organisation, over-centralisation, the army no longer reflecting the nation, tactics and training defective, and the staff overburdened with clerical duties, were perhaps some of the causes which led to disaster. When the war broke out, everything had to be created in the presence of an enemy; concentration had to be made before organisation began. The equipment and *matériel* were not ready, or could only be got after a complicated routine, while the War Office strove in vain to cope with the mass of business which poured upon it like a flood. With all this, however, there is nothing, I think, more wonderful than that energy by which, when the whole of the regular forces of France were captured or destroyed, army corps after army corps were raised, and placed in the field against the soldiers of Germany.

Since the war, the recuperative power of the French nation has shown itself not only in the development of national wealth, but in the systematic way in which the army has been re-created. But the character of the French nation is opposed to that rigid system of organisation and discipline which must apparently be a part of armies aiming at victory in modern times. Bravery and enthusiasm have ever been the attributes most marked in the soldiers of France, and although great efforts are now being made to supplement these high qualities, we must at present be content with the cautious verdict that time alone can show whether the result will be failure or success.

I will now ask you to try and trace with me the causes which have enabled the descendants of a handful of Teuton colonists to place their country and its army in their present high position. During the 30-years' war, Prussia was the battlefield of Europe, and the powerlessness of the Government to avert the evils which befell the country, may have given an impulse to that strong desire for unity the fruits of which we see to-day. The great Elector fostered the desire for religious freedom, and planted the fixed resolve to make the Prussian people a powerful nation. Frederic William I, and his successor, Frederic the Great, not only invented modern tactics, but endeavoured to infuse something of a national spirit into the army. But with all the reforms they instituted, the army was not then a national one, nor was the organisation permanent. When the military genius of the great king was removed, it seems as if the dry bones had alone remained without the animating spirit. The pedantic battalions of Prussia could not withstand the shock of the enthusiastic levies of the French Revolution. But if the army was beaten the nation was not, and the very oppression which they suffered at the hands of the French raised the national spirit of the Prussian people. The great minister Stein, unconquerable enemy of France, enlisted the national spirit by material reforms, and by nourishing the desire for freedom, while to Scharnhorst it was given to prepare the organisation which has been elaborated to its present standard. It was in 1814, when it was declared "that in the lawfully administered armament of a nation lies the best security of lasting peace," that the forces of Prussia first became a national army, and it was his organising genius which enabled Prussia to contribute so

largely to the final overthrow of her enemy on the field of Waterloo. But when peace again reigned over Europe, Prussia did not sleep in the memories of the past, and the development of her military system was carried on with steady aims amidst the storms of civil dissension, until at last the overthrow of the Austrians in 1866 demonstrated the value of the reforms which had been so persistently effected. After the war, the staff, organisation, equipment, *matériel*, and the tactical training of the troops, received at once the widest and most minute attention. The gradual preparation for war, the enlistment of the resources of the State in every particular for the inevitable struggle with France, enabled Germany in 1870 to take the initiative and to put her mighty forces in motion towards the frontiers with that regularity and comparative absence of confusion, which is born of fore-thought and supreme control, co-existent with the proper sub-division of responsibility and labour.

The character of the German people, frugal and temperate, not easily excited to heroism nor discouraged by defeat, not possessing qualities of enthusiastic courage, but filled with a strong sense of duty, is reflected in the army, which is but a part of the nation. Neither officers nor men possess higher qualities than those to be found in other armies, but the mental and physical education is exact, the administration is simple and intelligent, and is worked by men who are masters of their profession. The system is really nothing more than a development of careful forethought and preparation, and a thorough acquaintance with one of the first principles of German mobilisation,—that every person in authority should know in peace what would be required of him on the order to mobilise, and must expect no further orders. Strongly united in the bonds of national military discipline, animated by a high sense of duty, looked up to by the nation as the instrument by which national power has been attained, the German Army is a great force in the history of these days, either for good or for evil. Its power, I venture to think, has not been created by the genius of one man, by the discovery of fresh formations in tactics, or fresh devices in strategy, or by novel means of destruction. The German administrators and soldiers have known how to create a national army, how to effect gradual improvement in every branch of that army from the highest to the lowest, and how to contrive the parts of the military machine that the whole may be set in motion without undue friction, and with that power which enables great military units of force to be raised rapidly to a war standard, equipped, and launched into the field.

The causes which have given birth to the solid glories of England are in some respects different from those which have led to the rise of military power in France and Germany.

No nation in the world can show a history so full of triumphs as that of the British nation. While the German Army can hardly trace its history further back than the days of the Great Frederick, while the French Army is a thing of to-day, the historical records of British regiments bear a roll of victories in the long past before the armies of continental nations were in existence. The union of races, the early

practice in war, in athletic exercises and feats of arms, led to the early fame of a people which was formed of the Anglo-Saxon race and the Norman chivalry. The Englishman was ever encouraged to excel in martial exercises ; and field sports and games have been, and are, a national passion. And even when progress in the arts of peace might seem to have pushed back the warlike spirit, we know that it has received a fresh and lasting development in that great volunteer movement which led thousands of the youth and manhood in England, in the Colonies, and in India, to devote their leisure to training in arms.

The national militia of the Anglo-Saxon period, the household troops and the paid forces of the Plantagenets, are all represented in the army of to-day. And coming down to later times, you will remember the national character of that Parliamentary Army, which was renowned for steadiness and discipline, and for the quietness with which it ultimately returned to the civil population from which it was drawn. The simplicity and power of the administration, the tactical formations, and the organisation of that army are all well worth our study. Whatever may be the merits of the origin of the struggle between King and Parliament, none can deny that the qualities of the army were worthy of the English name, commanded as it was by a man whose foreign policy was summed up in the words which he addressed to the Pope—that if the people of God were not respected, the thunder of the English guns should be heard at the Castle of Saint Angelo.

After the restoration, we know that the Parliamentary Army was disbanded, and only a few regiments retained for guards and garrisons, and that it was not until the reign of William III that a standing army was established as a constitutional force. Time will not permit me to do more than recall to you the victories under Marlborough, the great exploits in India, and the ineffectual struggles in America. But these successes, not indeed unchequered by defeat and disaster, were not won by a national army. The ranks were recruited from the lowest classes ; the administration was corrupt and defective ; and the nation regarded the army as a band of hirelings paid for fighting.

The campaigns of the Peninsular War crowned the successes of the British army. The great Pitt had infused into the nation some of that indomitable energy which saved his country and saved Europe ; and although we may look to the career of Wellington with just pride, we must not forget that the resistance to the military ambition of Napoleon was at the outset due to that minister, of whom it has been said, that even when the horizon of England was darkest, no soldier came out from his presence without feeling braver than when he went in. But the glories of the Peninsular War were not due to any value of the military administration. Wellington indeed, it has been well said, had to modify his own warlike plans to meet the huxtering spirit which dealt out his annual contingent of men and *matériel*, very much as if he were some powerful pensioner, whose extravagance was a burden on the national resources, ever needing the wholesome check of parsimony. It was in the long experience of these wars, crowned at last by Waterloo, that Wellington, centralising everything in his own hands, and by his

consummate capacity for details, perhaps even preventing the formation of a permanent military system, brought the armies of England to the highest perfection of field organisation, so that the British army, when peace caused England to lay down her arms, was looked up to by all nations as a model of military renown.

After the peace of 1815, it seems to have been thought that England would never again draw the sword. Indian and colonial wars occurred in far-off portions of the empire, but as an army ready to take the field, the forces of the country seem to have vanished. With a chaotic military administration, with neither commissariat nor transport, and scarcely any artillery, the British Army was a mere body composed of a few regiments of cavalry and battalions of infantry, alternating in their service between the dullness of country quarters, the dreariness of colonial duty, or the solitude of Indian cantonments.

The outbreak of the Crimean war found everything military at the lowest ebb, except, indeed, the gallantry of the officers and the discipline and courage of the men. As to the military administration, if it had been altogether absent, the wants of the army might have been better served than if directed by a complicated and unwieldy combination of contending elements. If the cavalry and artillery were excellent, the infantry battalions solid, the real wants of the army seem scarcely to have been thought of, and England appears to have imagined that contending armies were, to adopt the words of Sir Edward Hamley, like two skilled fencers who could thrust and guard, advance or retreat, just as it might please them, without any other requirements for war than the swords in their hands. The commissariat had been abolished; and although a conglomeration of stores was sent out for the hastily collected officials to administer, no transport was provided to move the supplies which were shovelled out to them from the ships. And although the pages of the history of that war are lit up by victories and by heroic examples, the suffering and the loss caused by defective administration form a dark background to the picture. Some idea of what was necessary for a country like England, some attempt to form a frame-work in peace, which should not break down in war, a little forethought and preparation, might have saved the wealthiest and most powerful nation in Europe from those bitter lessons she had to learn.

May we not conclude then that the lesson taught us in the Crimean war was that an army, not supported by the nation, guided by no proper military administration, and unsupplied with the requisites for action, is for modern war purposes of but little value.

And in our brief review of the military successes and reverses of other nations, have we not seen that the principal cause which has led to permanent success in war has been the national character of the armies supported by strong organization? In Greece and Rome the decline of the military power dates from the days when the army was no longer a part of the nation. The successes of France were won not merely by the genius of a Napoleon, but by the administrative ability of a Carnot enlisting the whole power of France; and were not her failures due to the absence of clear organization, and to the want of

union between the nation and the army? The early success of the Prussian army was not permanent, because, when the master-mind was removed, there was no national army and no real military system, to the presence of which the later victories of Germany must, I think, be mainly ascribed.

Our own successes have been won by the resolute bravery and the capacity of Englishmen, in spite of faulty organisation and administration, and because in the older campaigns time was given us to correct, at great cost of life and treasure, the defects which presented themselves.

Since the Crimean war, England has not been engaged with a European power; and although we cannot say that we have suffered no reverses in our Colonial and Indian expeditions and wars, the general results have given us experience, and have added to the laurels of the British and Indian armies. And the latest example in Egypt shows, I think, that we have made a practical advance in the power of putting forces in the field at a distance from England, and that neither the qualities of officers nor men have in any wise degenerated.

We may then, perhaps, say without over-confidence, that we have learned our lessons, and have trod steadily, if not too swiftly, in the path of progress. The administration has been simplified, training and education developed, the condition of the soldier changed for the better, and equipment and material improved. In tactics, although we have not acted upon the maxim of Napoleon that they require to be changed every ten years, ours are now abreast of the times for European warfare, remembering our difficulty is that we are called upon to modify these when engaged with other classes of adversaries. The great development of the volunteer movement; the introduction of short service; the formation of army reserves which, in spite of the gloomiest prophecies, have twice come forward almost to a man; the localisation of the army; the improvement of the militia and volunteers, and their greater union with the regular forces; the schemes for mobilising forces both for foreign service and the defence of the country, all seem to attest that we have been making some progress towards the creation of a national army.

It is the fashion, even among ourselves, to speak slightly of the military power of England; but if we consider that in the British and Indian Armies we have over 350,000 men; that the militia and volunteers in England, in the Colonies, and in India, number 400,000, may we not conclude that our aims should be, not to abandon the voluntary principle upon which the military forces of England are founded, but rather to try and systematise the splendid materials we possess? But having said so much, I venture to hope you will agree with me in thinking that the most ardent opponent of conscription can scarcely object to military training in schools, as a part of compulsory civil education applicable to all classes. Such a system would be no kind of compulsory service, but rather a general education, beneficial to the whole nation in the physical training, and ultimately to the army it would support.

Now the changes of the last few years have met with much opposition. But we must, I think, consider one fact. Under the old system we could not obtain the men and we had no reserves. And bad as this was in peace, the story of the Crimean war, when our long-service system had to be supplemented by sending out thousands of undrilled boys; when, worse still, we had to engage foreign mercenaries to fight our battles, attests how great were its evils in time of war. And taking another portion of the changes of late years which has been much attacked, does not the system of localisation, connecting regiments with particular parts of the country and with the auxiliary forces, and lately further developed, embody a far deeper principle than the mere convenience of military service or organisation?

Now, having progressed so far, how are we to secure the further improvement we desire, still retaining our voluntary system?

It seems to me, though I offer the opinion with great diffidence, that the answer to that question is the steady improvement not only of our regular forces, but of the militia and volunteer troops, the steady perseverance in the new path, and the constant development of that principle on which the territorial system is founded. We see what progress the militia and volunteers have already made, how militia, and even volunteers, desired to be embodied and to take part lately in active operations, a conspicuous example of this having been given, we may be proud to say, by a body of volunteers in this country,—that most valuable corps, the East India Railway volunteers. All these reforms cannot be effected in a day. Prejudices have to be overcome on both sides. But great improvements have already been effected, and the nation is beginning to see that soldiers represent the classes from which they are taken, and that the influence of training and discipline has a large effect in improving the individual in his relation to society. If the soldier be educated and fitted to take his place in civil life; if he is encouraged to learn what will be useful to him in after-life; and if an organisation be created to help him towards employment not only in Government service but in civil life generally, then much will have been done to render the army a real instrument for national education.

Assuming then that we constantly improve all branches of the army, and that we have promoted the union of the various forces, what means are we to take, to render these forces readily available? Now I think it may be said that the habit of Englishmen, at all events in relation to military affairs, has not been one of forethought or timely preparation for coming trouble. The very energy, self-reliance, and capacity for overcoming difficulties, have no doubt militated against any careful organisation of the resources of our country; but if any lesson can be gathered from the past, it is that we must be prepared to bring the whole of our energies and means of action into play with the least possible delay, with that clearness and simplicity which can only be created by vigilant preparation during the breathing time of peace.

Bearing in mind the objects for which the army and the auxiliary forces are maintained, the conclusion to which I venture to think we

must come is, that our organisation should be based on two main principles—*first*, that we should always be ready to put in the field two or three army corps of regular troops filled up by the reserves; *secondly*, that the militia, volunteers, and yeomanry, after deducting the numbers necessary for the defence of fortresses and entrenched camps, should be exactly organised into field army corps, prepared in every point for the protection of the kingdom.

No doubt some will object that all this will cost money. But the nation has expended enormous sums on the perfection of its matériel of war; it has given millions for the abolition of a system which at least was compatible with efficiency; it has spent millions on the localisation scheme and on the fortification of the shores of England. Why then should it be supposed the nation will grudge outlay on an organisation which would give it the most powerful combination of units of force for the defence of the country; or that it will fail to recognise that, with all the improvements effected, with 470,000 fighting men in the United Kingdom, the motive power, the simple organisation which alone is capable of calling all these forces into action, is yet wanting to complete the military fabric.

And turning to the military administration, should not our aims be to get rid of that dual system which has always failed us in war, to trust those who are called on to administer armies, and try and relieve them from that burdensome clerical work which makes an army of stationery only a stationary army? We must surely seek for a system of administration which shall combine strength with the difficult simplicity required by war, the supreme direction controlling tactical and administrative units of military force, embracing in themselves every element of power and responsibility.

I need scarcely say that there are many points on which it has not been possible to touch. It may, for instance, occur to some present that I have omitted the example of a great country founded by the Anglo-Saxon race—America.

But the American war seems to stand altogether on a different footing to the campaigns of other countries. It was not a war against a foreign foe, but a bitter and lasting struggle between two divisions of a nation. It was a civil war, into which the whole strength of the nation threw itself, on one side or the other, in a long series of campaigns, lasting four years,—forming a school in which war was learned only through the sharpest lessons by the party eventually victorious. I might have spoken to you of Indian Army reform, but that is a subject which most of us have been saturated with. I might have dwelt upon the development of arms, upon tactical training, and other topics, all of which might have rendered more interesting the somewhat dry discourse to which you have listened so patiently.

I have endeavoured to point to the causes which led to the glories of Greece and Rome, to the rise of French and German military power, to the warlike greatness of England, and have ventured even to enquire as to the directions our efforts should take in the future. Giving every place to physical training and prowess, and to the military genius of

commanders, all history seems to point to the necessity for the foundation of a national army, welded together by the love of our country, based on a true organisation, and administered under a simple system of control, which shall be capable of rapidly setting into motion the national forces accumulated in peace time. The materials are present to our hands; let the nation breathe into them the animating spirit. Difficulties there are, indeed, but they are only to be overcome. Will genius, or courage, or perfection of arms or equipment, avail us, if we are unable to set the whole of our military forces rapidly in motion? The true test of the efficiency of an army system is surely to put trained, disciplined, and equipped men into the field at the right places, and in the shortest possible time. In old days the experience of long campaigns gave us armies which were renowned throughout all lands. But we must now get ready for the swiftness of war by the steadiness of our preparations in peace, remembering that our next campaign may be against stronger foes than those we attacked on the heights of Mazra, or in the entrenchments of Tel-el-Kebir. A just military system gives free play to the energies of great men, to improvements in arms and in tactics, while it can be worked by men of ordinary capacity. Should not our aims be, whether in England or in India, to maintain constant watchfulness for improvement in every branch and every detail, to simplify the administration, to give power to those who should hold it, not to let our forces remain as isolated units, nor to fuse armies into one unmanageable body, but to separate them into distinct units of force, which may be worked by a less complicated machinery than we at present possess. Let us neither be unduly elated by triumphs, nor cast down by reverses, but let us hold fast to these aims through all changes of governments and of men. If the army be governed by a simple and decentralised administration, and founded upon a correct organisation, the nation will secure, as its reward, a national army, the most perfect security for order, led by the gentlemen of England, and manned by its hardy yeomanry and peasantry.

Only let the nation secure those principles which must govern a national army, and it may trust its soldiers to press forward in the path of duty in the time to come, until that far-off day of which the poet sings, when we shall ring in the thousand years of peace; when the death of war shall be sung; when nation shall not lift up sword against nation, neither shall they learn war any more.

II.

SUMMARY OF A PRIZE ESSAY ON "PARAPLEGIA" OR "WIND-STROKE,"

BY

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Paraplegia is paralysis of the anterior or posterior half of the body, and is due to disorder of the vertebral portion of the Spinal cord below the decussation in the medulla oblongata. In the subject we have under consideration, the paralysis affects the posterior half of the body, and the term Paraplegia is generally narrowed in application to this form only.

Nature.

The disease is more prevalent in some parts of India than in others, the principal localities being Thayetmyo, Rangoon, and most parts of Burmah, the Malabar

Locality.

coasts and the Punjab.

All places in the vicinity of jheels and marshy ground, where cold, damp gusts of wind prevail, are localities favourable to the production of it, but cases of paralysis of the hind quarters may be found in the midst of a city, pointing to the fact, which will be hereafter enlarged on, that other causes than "Wind-Stroke" produce the disease.

Symptoms.

Kumree, as the disease is called in the Vernacular, may be divided into acute and sub-acute

forms.

1. The sub-acute form.—When taken out of the stable, the affected horse moves tolerably well, but when trotted in a direction away from the observer, the rolling gait will attract attention, as will also the dragging of the toes along the ground. Turned round sharply, the horse will either fall or stagger, and if backed forcibly, will groan and move either with the greatest difficulty or drop on the haunches.

Treatment occasionally meets with partial success, but there is generally a recurrence of the paralysis.

Cases of the sub-acute form vary in intensity, some work fairly well, but when backed on their haunches, fall, others trot and canter even with fairly healthy action, but when turned suddenly, lose all power of locomotion. Others again shew symptoms of weakness when being mounted. The flinching of a horse on pressure being applied to the loins by the hand is often taken as a proof of the existence of the disease, but many healthy animals will yield to pressure applied in this way.

2. The acute form.—One of the first symptoms likely to be present, is that the horse is lying down, and if the case is very recent, endeavouring to get up and shewing great excitement on account of

being unable to do so. The pulse probably accelerated and bounding, mucous membranes slightly congested, but temperature normal. Loss of sensation is not invariable, the sensory nerves not being necessarily affected, but acting simply as conductors of the shock. In severe cases, paralysis of the motor nerves almost invariably extends to the involuntary muscles of the bladder and rectum, in consequence of their connection with the sympathetic ganglia. The disease may be confined to one leg in the commencement, but its fellow is speedily attacked, and the whole body may become effected, death resulting, even in the short space of one day, in spite of all treatment.

The causes of the disease are many, but the imaginary causes still more. Theories advanced have been perplexing, astonishing, and often contradictory. In

Causes. In Burmah, when one battery lost 80 or 90 per cent. of the horses, the bad quality of the water was considered to be the cause, it being found on chemical analysis being made, to contain a large quantity of Phosphates. This as a cause is doubtful, as men (and the human being is also subject to the disease) who partook of the water remained unaffected. The disease certainly decreased after the animals had been supplied with water from the river, instead of the well water originally given, but it would also have probably subsided without this change on account of the ordinary cessation of the outbreak. Most of these cases occurred before the rains; the weather was hot and muggy, with, during the night, occasional puffs of cold, damp air, the horses were not clothed, and being in frequent sweats, got chilled across the loins. These were in fact cases of "Wind-stroke."

Phosphorus administered in large doses would prove poisonous, and the symptoms in the latter stages might resemble Paraplegia, but these would be preceded by internal pain, evinced by violent struggling, shivering, &c., and it is impossible that Phosphorus combined chemically, in small quantities, with Lime, Soda or Magnesia salts, and held in solution in the well water, could poison so large a number of horses as 80 or 90 per cent.

Fungus growth on grass is one cause. The description of grass known as "Rumnah" when harvested in very wet seasons, is often covered with "puccinia," penicillium and aspergillus, that is to say, smut and mould. When taken in small quantities this grass is apt to produce colic, but when devoured voraciously, produces poisoning and paralysis.

Another cause ascribed, has been bad drainage, but disease life forms, such as Bacteria, which emanate from ill ventilated and ill drained stables, tend to produce Anthracoid disease, and not the suspension of the motor nervous force. This theory may be dismissed.

One more cause is "Stroke of the wind," that is, cool gusts of wind passing over a horse's quarters and loins when it is hot and wet with sweat, producing disease which eventually ends in acute or chronic myelitis and paraplegia.

To prove this, it will be necessary to describe briefly the structure of the parts, afterwards demonstrating why cold air should have such

an effect; but before proceeding to do so, I must state the conditions necessary to the production of motor paralysis.

1. Lesion of a nerve in some part of its course destroys its power of transmitting that force which is expressed by a contraction of the muscle to which the nerve is distributed.

2. Lesion of some part of those central parts of the nervous system, whence the nerve takes its origin, or with which it may be connected, directly or indirectly, which cuts off its supply of nerve force.

By the foregoing conditions which give rise to paralysis, it will be seen that it is the nervous system which is principally affected. The derangement of one or more of the other systems (muscular and vascular) is the primary cause, the result being the incomplete action of the nervous force.

The nervous system is divided into three sections, *viz*:—motor, sensory, sympathetic, each section having a separate function to perform, but they are all intimately connected with one another. The motor and sensory nerves are derived from the Spinal Cord, while the sympathetic nerves are complete in themselves, not emanating directly from the brain, &c., but from a number of ganglionic centres. These ganglia are connected with motor and sensory nerve fibres; thus the renal ganglia receive compound branches from the lesser splanchnic and the lumbar nerves, and the lumbar ganglia receive two communicating branches from the spinal nerves, as do also each of the pairs of the sacral ganglia. The grey neucliated fibres, which emanate from the sympathetic ganglia give off minute branches to the blood vessels in their passage to the cord. The knowledge that these nerve fibres are distributed to the coats of all blood vessels, the capillaries excepted, and that they then form there a perfect network, tends greatly to elucidate the principal causes of kumree. The inferior column of the spinal cords is composed principally, if not wholly, of Motor nerves. These nerves are distributed to every muscle in the body and any irritation to a sensory nerve fibre, immediately produces, by a reflex action in the motor nerves, contraction of the muscle, which when under control of the will, causes the act of motion. The arteries which supply the spinal cord with the necessary nutrition, branch and subdivide into innumerable ramuscles and capillaries in the pia mater, and insure uniformity of distribution to the nerve substance. It will be unnecessary to enter into any further description of the circulation of these parts, or to enumerate the muscles affected in the disease, beyond stating, that in slight cases, they are principally the great flexors of the hind limbs, and in severe cases, all the muscles posterior to the affected portion of the cord.

The sympathetic nerve fibres form a complete network in the coats of all the blood vessels, and this also applies to the periphery of the whole body. Horses in hot climates are very apt to sweat, even without exertion, and to receive chills from the passage of cold damp air over the heated surface. The heated state of the body is the result of increased action of the heart, the blood vessels being relaxed and

more apt to become diseased than if in a more tonic condition. The cool air passing over them irritates the sensory nerves, which communicate, through the sympathetic, the irritation to the motor, causing sudden contraction of the blood vessels of the skin and meninges of the cord, while the shock is conveyed to the spinal nerve substance by medium of the ganglionic centres. By the contraction of the vessels caused by the quick action of the motor nerves, stagnation, congestion, and consequent effusion occur, and congestion of the meninges and consequent effusion result in softening of the cord. The suspension of nutriment caused by stagnation of the blood, much accelerates the softening, and molecular death extends unless speedy remedial measures are had recourse to. Communication between the cord and the nerves issuing from it will be interfered with on account of the stricture formed by the congested vessels and effusion, and no sympathetic current being communicated from the cord to the motor nerves, muscular paralysis necessarily ensues.

Another frequent cause of Paraplegia is onanism. Repeated excitation of the sensory nerves of the genital organs, extends to the spinal cord and causes disease of its structures. Persian, Northern, and low caste Arab horses are very prone to Paraplegia from this cause.

Cases of Kumree too occur from injury by carrying heavy weights, and also by the presence of bony tumours in the spinal canal, pressing on the cord. This exostosis of the vertebrae, resulting from young animals being made to carry heavy loads, before their bones are sufficiently compact to enable them to do so.

There are several other minor causes, but the principal are Fungi on the grass, standing in draughts and getting a chill, and onanism. The first producing apparent, and the second and third, true Kunree.

An animal once really attacked by Paraplegia never completely recovers its usefulness. Of the various breeds, Australian horses are more liable to be affected by cool gusts of wind than others, but Arabs and Northerners, including Persians, shew a greater percentage of cases of paralysis from masturbation.

In acute cases, where inflammation of the membrane of the cord exists, the abdominal viscera, on post mortem examination, will be found healthy, but on examining the spinal cord (and great care must be taken in opening the vertebral canal not to injure it) a portion, probably extending from the second lumbar as far back as the second or third sacral vertebra, will exhibit a red appearance arising from congestion of the covering membrane. On opening the membranes effusion will be found between them, aggravating by its pressure, the disease. If much effusion be present, there will often be serous effusion of the cord, arising from imbibition of the fluid in contact with it.

In chronic cases, softening is almost always present, the cord presenting a dirty grey colour, with the centre diffuent, and sometimes of a yellow colour, resembling pus. This is only, however, in rare cases, where the horse has been kept for a considerable time and not, as is usually the case, destroyed as useless.

Pathology and Post mortem appearances.

In many instances where the horse has been destroyed in the early stages, the external appearance of the cord is healthy, but on making a longitudinal section, shews a small white, softened portion, apparent to the touch, but rendered more evident by the flocculent surface produced on subjecting the section to a slender stream of water. Anterior and posterior to the diseased part, the cord appears healthy. Individual nerves are often found hypertrophied, the enlarged condition being due to the neurilemma or a fibrinous deposit within it.

The effect of the morbid act of masturbation is to produce hypertrophy of the sympathetic nucleated fibres, which supply the blood vessels on their passage to the cord, causing congestion, stagnation and insufficient nutrition, resulting in extensive softening and amyloid degeneration of the spinal cord.

In the case of bony tumours, the sequence probably of an injury, paralysis is caused by atrophy of the cord in the immediate neighbourhood of the exostosis, often followed by softening and disintegration of its tissues.

The microscopical examination of different specimens of softened cord substance, shews in the external or grey portion, fragments of nerve cells and globules with "double lines," of various sizes and forms, and numerous granules. Aggravated cases usually present the appearance of granules and fatty cells. The softening in cases of myelitis generally proceeds from the grey to the white matter, the tint of the former becoming a reddish and of the latter a dirty white colour. In rare cases the white softening of the cord is the result of effusion independent of inflammation.

The above appearances of softening, together with the debris of the nerve cells of the cord (forming globules of the white substance of schivann) are the usual microscopical results of the examination.

It is conducive to the successful treatment of a case to first try and determine the cause by ascertaining the length

Treatment.

of time which has elapsed since the primary attack, and whether there has been acute pain during or since the first symptoms. In cases of the intense form, when inflammation of the Spinal Cord or its membranes exists, there must be increased flow of blood to the part; and we then find irritation of the motor nerves and twitching of the muscles with tenderness over the part. The object of treatment in such cases must be to diminish the quantity of blood sent to the spinal cord, and no agents are so efficacious for the purpose as Ergot of Rye in two drachm and extract of Belladonna in one drachm doses, since they both produce contraction of the vessels of the cord and its membranes. Fomentation with hot wet clothes, or the skin of a newly slaughtered sheep (placed with the inside to the skin and renewed every 12 hours) applied over the loins will be found to give great relief. In the event of the bowels being costive $\frac{1}{2}$ pint doses of linseed oil should be administered every 12 hours until the desired effect is produced. Aloe being unreliable is not recommended. After the second week, if the other remedies have not had the desired

effect, the use of Iodide of Potassium in two drachm doses, in combination with the Belladonna and Ergot of Rye is recommended, given 3 times daily. Opium is to be avoided as it produces congestion of the Spinal Cord. The animal should be well fed, kept in a clean, comfortable stable, with a good bed; quietude will also be beneficial. In the event of there being restlessness or excitement, Tincture of Aconite in 10 drop doses, ought to be given every two hours. A blister to the loins of Biniodide of Mercury one part to eight of lard, has been known to do good, in several cases.

In paralysis due to diminished nutrition of the cord (such as that caused by white or non-inflammatory softening and reflex paraplegia) a directly opposite course should be pursued. In such cases when there are no signs of irritation, congestion or increase in the vital properties of the cord—such diet and remedies as will tend to improve the quality of the blood and cause an increased supply to be sent to the cord and augment the vital properties of the nervous centre, must be had recourse to.

Strychnine in $\frac{1}{2}$ grain doses, twice daily, gradually increased to $1\frac{1}{2}$ grain is advocated, and may be combined with opium in $\frac{1}{2}$ drachm doses. Sulphate of iron in one drachm doses with Gentian $\frac{1}{2}$ drachm, Chyretta one drachm, and sulphate of Quinine one drachm, is a useful tonic mixture, as is also Nitric and Hydrochloric Acid in twenty drop doses, twice daily, well diluted. Repeated blisters of the ointment of the Biniodide of Mercury ought to be applied, but Cantharides is objectionable, acting on the kidneys and causing increased secretion. The actual cautery has occasionally been used with success. Where actual softening of the cord has taken place no relief can be hoped for and destruction of the animal is the most merciful course to pursue. In one case galvanism was tried, one pole of the battery being inserted into the rectum and the other secured to the loins by means of a surcingle, but no benefit was derived, and as the application caused great excitement to the animal, injury probably resulted. Phosphuretted oil in $\frac{1}{2}$ drachm doses has also been tried, but without success. The best treatment is tonic and palliative, with external stimulants.

Careful inspection of the Forage is very necessary. It should be free from weeds, fresh, and if harvested, sweet smelling; above all it should be free from fungus which may be the cause of death. Next, the aspect of the stable requires attention, more especially with regard to the neighbourhood of jheels or marshy land, over which the wind passes before reaching the stable. Stables are not necessary to *prevent* wind-stroke, and simple sheds are more healthy, but the constant wearing of a small warm jhool over the loins is strongly advocated. It prevents "chill," protects from sun if the animal is standing in the open, and keeps the coat clean. The Arabs always clothe their horses night and day, and their coats are, as a result, always fine.

Thoroughly drying horses, after exercise, is very essential as a preventive measure, and if this cannot be done immediately, the animal

ought to be protected by a rug; and this ought also to be done when animals are kept standing about in harness, &c.

To prevent onanism, from which habit reflex paraplegia is apt to occur, a broad belt is often fastened round the body, the part under the abdomen fitted with spikes, but this cannot be done at night, as injury is likely to occur in lying down. Care should always be taken to remove exciting causes, by keeping mares apart from horses, and in such a position, that the wind will not carry the scent of the excretions, &c., of the former to the latter.

SIMLA,
5th October 1882. }

GEORGE A. OLIPHANT,
Offg. Principal Vety. Surgeon.

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### III.

#### THE ARMY OF BOKHÁRA IN 1880.\*

*From the Russian of M. Arendarenko in the October Number of the VOYENNI SBORNIK (Military Magazine) of 1881.*

BY

MAJOR WALTER E. GOWAN.

This translation may, perhaps, prove of greater interest in that the Khanate of Bokhára is likely to be the next piece of territory that will be absorbed into the Russian Empire, whose border line will then be a vast stretch of the Oxus and within a measurable distance of Afghán-Turkistán.

The brilliant Irdjár engagement on the <sup>8th</sup><sub>20th</sub> May 1866, which cast Irdjár engagement and its results. such a lustre on the Russian arms, throughout Central Asia, and which shattered in the eyes of all Mahomedans, the importance of the Amir of Bokhára, as the supreme head of the Mussulmán faith, first made us acquainted with the warlike qualities of the Army of that Khanate. Subsequently a series of other victories over the Bokhárians, resulting in the annexation of Forts Khodjent, Ura-Tube, Djizák and Yángi-Kurgán, and the fall on the <sup>1st</sup><sub>13th</sub> May 1868 of the town of Sámarkand, compelled us to carry the border line of Russian Turkistán to the Zera Bulák hills, 150 *versts* (100 miles), distant from Bokhára, so as to finally dispel the political illusions of the Amir Muzafar Khán and to check the military ardour of his Uzbek population.

Towards the end of the year 1868, political events having obliged us to again have recourse to military measures, Further Russian operations. and to despatch a force from Sámarkand to quell the insurrection raised in Kárshi by the Amir's eldest son, Abdul Malik Katta Tura, whose object was to overthrow his father, we, after scattering the insurgents, assured the Bokhárians of our desire to establish peaceful relations, and at the same time brought home to the youthful heir to the Khánate the folly of his dream concerning the destruction of the Russians.

All these but recent military and political events in a territory Peaceful relations between Russia and Bokhára. which Asiatics have always regarded as both considerable and powerful, have, since 1869, given place to frequent negotiations between our Turkistán Administration and the Amir, have strengthened Russian

\* The Russian way of rendering Proper names has been adhered to in this translation. This method has, at least, the merit of uniformity, which is more than can be said of that followed in English translations from the Russian as a general rule.

A French translation of this Paper will be found in No. 551, page 293 of the *Revue Militaire*. W.E.G.

influence over the Bokhárians, have established regular trade relations, have aided in the accumulation of scientific details regarding neighbouring countries, and now admit of the possibility of preparing the way, through interrogations and personal observation, for certain information concerning the Army of Bokhára.

Whilst compiling these short notes at Bokhára, we have not been able to avail ourselves of books or of official media for correcting or investigating the development of military science amongst the Bokhárians from the earliest days, or the various stages of this tactical development, beginning from the time of the campaigns of Tamerlane

In the earlier stages of its existence, [1363-1405], the first and best of Asiatic leaders. To group such information would, we suppose, be a difficult task even for a military specialist, because Mussulmán chroniclers and historians of bye-gone ages never gave minute particulars of the fights of their day and never wrote at all about military matters.

It can only be gathered from Mahommedan literature that "discord is as well known to man as the use of bread" ; that war (*mukadama*) is the means of diffusing the religion of the Eastern Prophet ; that a holy war (*Gazí*) is obligatory on every one of the faithful since Mahommed has inculcated it in the Korán.

From Narshakhi, Tarikhi, Djigan Kushi too, it may also be learnt that all the Arab (666), Turkish (1004-1113), Mongol (1226-1363), Tatar (1363-1405), Uzbek (1405-1800), conquerors carried on their raids into the countries of Central Asia and performed deeds of prowess in striving for the mastery of the Khánates with the hordes and other races of every kind who were unknown in the beginning of the hierarchy that was introduced into Asia by the conquerors Ghingiz and Tamerlane (especially) from the countries of the west.

These same Eastern Historians likewise tell us that the hordes of Ghingiz Khán, the armed bands of Tamerlane, Baber, and of other conquerors, were almost always mounted ; that they were partly armed with cold steel and with bows and arrows ; that they were divided into detachments (*oskor*) ; that they had leaders (*lashkar-bashis*) ; that they mercilessly killed their enemies and the inhabitants of the countries which they conquered, turning those lands into deserts of which they became complete masters.

Of the manufacture from the Mongol stream of lava that flooded Central Asia, of a special class of military men (*sipdhis*) ; of the introduction in the time of Tamerlane of the first firearms ; and of the influence of these on Asiatic tactics ; of the ancient organisation in the Khánate of Bokhára of armies (*lashkars*) as a separate functional element in the political life of the country, we gather full information from book sources. But we must now hasten to describe at least a portion of what popular tradition has preserved in tales of modern times.

It is affirmed on all sides that since the days of Timur (Tamerlane) the people of Asia have preserved the tradition of an army with a general leader (*Lashkar-Bashi*), of detachment leaders (*Sér-Kérdé*) over ten thousand horse-men, of sectional commanders over a thousand, hundred, and ten horsemen, respectively.

Timur's forces consisted exclusively of cavalry and they carried out all military operations according to rules that had been worked out by a famous Chief-tain and one experienced in battle.

Their armament consisted of spear, sabre, bow, club or mace, and flint matchlock fitted with prongs to insure accuracy of aim. They had also cast iron cannon and long heavy weapons of large calibre (*jazais*), which were slung on horses and which required not less than four men to work them under fire. The ammunition and magazine stores were prepared in the Amir's workshops by various mechanics who were brought from Persia and other countries to the west. The forces were divided into cavalry (*atchapars*) armed with cold steel (*zarak*), mounted sharp shooters (*mergen*) with falconets (swivel guns). The cannon served for the defence of forts of the same type as are to be seen in Bokhára at the present day, *viz.*, a castellated wall 21 feet high with barbettes covering 28 feet, but without exterior ditch.\*

The whole of Timur's army comprised the military caste of the country (*sipáhis*) and was in the receipt of various monetary allowances as well as recompense in kind, and such plunder too as a constant state of war enabled it to lay hold of.

Thus the military organization, the commencement of which dated from the hordes and armed bands of various elements under the command of heroes (*bahadurs*), received in Timur's time such shape that the lower ranks (*alamans*) and officials (*amaldars*), who had hitherto been appointed by the sign manual (*yarlik*) of the Amir, came to be chosen on the nomination of the leaders from the body of the rank and file from such as distinguished themselves in war or who had shewn zeal in the service. Upon the *amaldars* were conferred rights corresponding to those of the military leaders, and they were appointed to various posts in the civil administration, receiving a certain fixed salary as well as *Khilats* (Tun), the bestowal of rents and various lump sums. All promotions and rewards, as well as appointments, were notified by the Amir, and were made with his personal knowledge or on the recommendation of the military chiefs, *begs*, and district officials.

The army was raised and recruited amongst those horsemen who were willing to serve. Once a man had entered, he was obliged to remain on till death and to be in readiness for all military requirements.

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\* During a decade of complete peace amongst the inhabitants of Bokhára, all the fortified forts of the Khánate having gone, through the carelessness of the Government, without repairs, are now in heaps of ruins. Author.

For convenience of maintenance, the troops lived at their own homes but had to appear on the first summons for a campaign or other necessity.

Consequent on the difficulty of keeping up a large standing force on a fixed rate of pay, the Amirs, after the time of Tamerlane, considerably lowered their expenditure by having recourse, on occasions of necessity only, to the services of temporary soldiers (*naukars*), raised from conquered peoples, to whom they issued equipment and recompense from the spoils of war.

Such *naukars*, at the best a disorderly rabble, ignorant of all military matters, only burdened the army and were turned after the war into ordinary peaceable inhabitants, on the understanding that every individual bearing the designation named, joined the district contingent on the very first mention of a new campaign.

Commencement of a Bokharian Standing Army with reserves. Hence dated the beginning of a Standing Army (*lashkar*) and the calling out of reserves (*talab-zar*) in case of need.

The forty years' reign of the Amir Timur, and the extension of his sovereignty by constant wars to the Ganges, the Sea of Marmora and Gobi, whilst it did not establish his monarchy on a political basis, gave it some constitutional structure and left a strong impression both on Asia and on Europe.

The reputation of Tamerlane, both as a famous leader and conqueror, was maintained in Central Asia for three whole centuries with such effect that all subsequent leaders bowed to it, and all the governing bodies comprising Timur's monarchy took it as a model in the science of waging war, regarded it as a gift from on high, and prostrated themselves before it with mystic dread, following in everything Tamerlane's tactics and Tamerlane's system of army organization. Such was the power of enchantment exercised by the forty years' doings of this remarkable Asian conqueror who had built up for himself for ages a world-wide celebrity, not through noble lineage, not through his descent from a simple Turgai headman of Shahr-i-Sabz, but through his striking mind, his iron will, and extraordinary energy.

As for the sons of Timur, the inheritors of a vast sovereignty, it was not because of their dismantling the military structure which their father had built up—a structure which was the surest safeguard of that age from every political tempest and danger from without—but because of their ignorance that their sovereignty was brought into gradual decay, terminating in the formation of the inconsiderable Bokharian Khanate.

The later ruling dynasties of Sheibani, Ashtor-Khanadi, and, last of all, the Mangits, adhered, it is said, with such unaccountable blindness to Tamerlane's military system, though it was in no way adapted to the requirements of their time, that they were consequently always defeated by the Persians who were once comprised in the monarchy of the Amir Timur.

But Shah Murád Mahzum, Amir of Bokhára, (1784-1803) was a more calculating man, and he, with the aid of his fanatical Uzbaks, waged several successful fights with the army of the Persian sovereign Shah Abass, and was the first to see the necessity of introducing into his military system, field artillery and a very inferior number of foot soldiers.

Shah Murád's grandson, the warlike Nasroola Khán, (1826-1860), though not actually at war with Persia, not unfrequently triumphed over his rebellious vassals and Kokan, until conscious of the approach of threats from the west, he busied himself yet more in the military perfection of his army wherein the voluntary system of *naulkars* was more in the ascendant than the body of standing troops.\*

Nasroola Khán greatly improved the field artillery, for which he introduced the English organisation as altered by Afghán artillerists, and he also added to the strength of the heavy cavalry, a body of *Kasabardars* with falconets. He somewhat augmented likewise the force of infantry which now began to be used as a cover to artillery and in the storming of fortified places.

For all these reforms, including the addition of field artillery, drawn by horses instead of oxen as had hitherto been the case, the Amir Nasroola Khán was obliged to a certain traveller, a Persian, by name Abd-Samat, who having been beforehand to India and Afghánistán, contrived so to display his military qualifications in Bokhára that Nasroola Khán, who was always dreaming of the title Shah-i-Shahán (King of Kings) made him generalissimo and entrusted to him his army in all his campaigns against Kokan. Although Naib Abd-Samat was fortunate in his military operations against the Kokandians, Khivans and Shahr-i-Sabzians, his conduct was such that Nasroola suspected him of being a party to a conspiracy against himself, and so directed his execution in the 9th year of his residence in the Bokharian Khánate.

Nasroola Khán's successor and only son, the present Amir Muzaffar Khán (1860), in the beginning of his reign not only carried on frequent expeditions against Kokan and Shahr-i-Sabz, but imagined that he could re-establish the glory of his ancestors by the extension of his power at the expense of the Russian conquests in Central Asia.

To a youth, unacquainted with his position and always under the pernicious influence of his nearest courtiers, flatterers and deceivers, a struggle with the Russian Turkistán forces, which at the time were very weak, seemed to be advantageous, and so such a dream began to show itself in an aggressive policy, in hostile measures, in gradual but considerable military preparations, and in looking for aid towards Persia.

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\* The voluntary system as applied to the Uzbaks still exists in the Khánate of Bokhára, but its strength is more paper than real. Author.

Thus then, during the first five years of the reign of Muzaffar Khán, the army had been increased as follows—the infantry to a force of 6,000, the number of swivel guns being also augmented; the field artillery too, was raised to a strength of 15 platoons with 4 guns attached to each, a corresponding addition being made to the complement of establishments.

Side by side with these reforms in the numeral strength of the Bokharian forces, improvement took place in the regular administration by the issue to the infantry of a fixed rate of pay, by the holding out of various encouragements to the leaders, by the enrolment of the cavalry, artillery and *Khasabardars* for a specific period, and by the issue to them of rations on a scale assessed according to the yields of the *kharaj* land taxes which the Bokharian population paid in proportion to the amount of their land produce.

Interest too began to be shewn in the casting of cannon, in the manufacture of powder, and in the issue of arms, the infantry receiving a more military organisation.

For the two purposes first mentioned, mechanics were sought out in Persia and with them the ignorant Bokharians were very pleased, seriously supposing that with the aid of their various reforms they would be able to conquer the Russians without trouble.

The chief adviser of Muzaffar Khán, with respect to the strength of his army, was the Persian exile Mirza Shahrookh. This man was in command of the whole of the infantry which he had organised after the model of the Persian army, with the addition of not a little of that phantasy so characteristic of this instructor.

And certainly, the fruits of the exertions of Shahrookh to instruct the *sarbazais*, and to generally reform the Bokharian forces, hastened the events at Irdjar on the left bank of the Sir-Daria, where a force of 2000 Russians under General Romanovski defeated Muzaffar Khán's army of 40,000 men, capturing 46 guns and the whole camp, including the private tent of the Amir, who barely contrived to gallop away and who had to do so without receiving from his chiefs on the battle field an account of those "successes" of the Bokharian forces, and of their promises to "blow all the Russians away from guns."

The failure at Irdjar cost Shahrookh his head and opened out a career for the fugitive Siberian Cossack Tartar, Osmán. This bold and shifty Russian deserter, from the first months of his going over to the Amir, and from the date of his command of a small infantry detachment at Irdjar, had managed to persuade Muzaffar Khán and his attendants that all his failures were due to the inapplicable Persian organisation, and that it should give place to one on the Russian system, that the infantry should be armed with rifles and bayonets in place of their flint matchlocks.

Preparations for a war with the Russians.

The Persian exile Mirza Shahrookh.

Defeat of Muzaffar Khán's forces by a Russian detachment under General Romanovski.

Execution of Shahrookh.

The Russian deserter Osmán.

The Amir was, of course, happy to listen to a "Savant" of the military art, and as he had not lost hope of taking his revenge on the Russians, he commissioned Osmán to introduce into his army all the reforms he knew of. To a fugitive Siberian who knew nothing of infantry organisation, it was difficult to set about the business, and so his reforms were commenced by the gradual replacing of the arms in use, with the re-clothing of the infantry in the European style, and when, after various intrigues, the ranks of the *sarbazais* had been considerably augmented by deserters from Mahommedans in the pay of the Russians, the military reformer gave scope to his own capabilities, thereby acting on the Bokharian tardiness, suspicion and want of faith, as well as cowardice and unfitness for military duty.

The result of all Osmán's endeavours to reform the Bokharian army, (and in this he certainly attained to some degree of success) was the heavy loss sustained by the Bokharian infantry on the Chapanata heights before Sámarkand. And although his skilful manœuvring of the Bokharian battalions on the Zera-Bulák heights beyond Katta-Kurgán was a better performance, this affair also ended in the defeat of the Bokharian army by four of our Turkistán battalions, with two batteries and four *sotnias* of cavalry.

Defeat of Bokharian infantry by a Russian force on the Chapanata heights before Sámarkand.

Crushing defeat of Bokharian forces at Zera-Bulák.

The final disenchantment of the Bokharians, as to their military strength after Zera-Bulák, induced the Amir, Muzaffar Khán, to sue for peace, and it was also the cause of their dissatisfaction with their new military system.

Osmán was held to be guilty in that he manœuvred at Zera-Bulák with extended battalions, and that he did not obey the orders of Toktamish Bek, Commander of the Bokharian forces, and that he did not support, as required, the battalion of a certain Turkish exile, Khodja, who had trained his own battalion in the Turkish style. For all this the deserter instructor paid with his head at the hand of the executioner in 1868, or five years sooner than his rivals, Toktamish Bek, and the Turk Khodja. Such is the fate of all comers to the country of a barbarian who is generally depraved, and who holds flattery, espionage, deceit and treachery of all kinds as the highest of human virtues, and for which the most religious Moolla (Sufi) will contrive to find in his sacred book a *fatwa* or justification, if only he may obtain advancement from his master who rules the Khánate through the medium of spies and of executioners.

However this may be, Osman did considerable good to the Bokharian army, in that he gave the infantry some sort of settled organisation, as well as discipline, and made a fairly capable material of that which had been oppressed by centuries of despotism, and filled by masses of Persians who had entered the Bokharian ranks from captured gangs.

Good effects of Osmán's reforms of the Bokharian forces.



The latter element, the Shiah, are now considered in Bokhára the best bulwark of the government, and they occupy the highest posts in the administration, as well as aspiring to the command of armies. They comprise, too, the bulk of the body-guard of the Amir, Muzaffar Khán, (the *Jilzai-Sarbazais*), and hence they have received the designation of Kul-Batcha, or prison children, because they have been chiefly selected and purchased at slave markets from Bokhárian owners.

Passing now to the communication of particulars relating to the present state of the Bokhárian forces, as far as we have been able to become acquainted with them during our recent personal observations, and by means of information elicited in Bokhára, we will speak first of all of the infantry, and of those kind of weapons which have received such appreciation on account of their military fitness during the past 16 years under the guidance of foreign instructors, (Osman being the chief) who have introduced the system under which the Bokhárians are to this day being trained.

Observing, first of all, that to the *élite* of Nasroola Khán's infantry soldiers were confined the guarding of his artillery and the storming of fortified places, we would remark that the rest of his forces, and also his subjects, looked upon the *Sarbazais* with thorough respect, as on the protectors of their fatherland, and as on individuals who were always ready to give their heads with supreme delight.

In time of peace such volunteers are always readily procurable, so that the Government can always organise and maintain at their full strength not only infantry but cavalry and artillery as well. As a rule the individual who is desirous of serving in the ranks of the army, on hearing of an existing vacancy, applies to the leader of the particular unit in question, and this official receives the order (*mubarak-nama*) of the Amir to enter the applicants' name in such and such a company of a given battalion. The recruit then receives the Government weapons, with a bag containing cartridges fastened to a leathern girdle, a short red cloth jacket with one row of buttons and without any ornamentation, a pair of trowsers dyed yellow and made out of sheepskin. These, as well as the coat, are issued yearly. The recruit's pay is 4 *roubles* (about 10 shillings) a month. He gets also annually a pair of boots made with long pointed toes. The ends of the trowsers are let into the boots. We should add that each infantry soldier also receives yearly a black lamb-skin, and out of this he has to sew for himself a low Tartar cap. We have now acquainted our readers with the full amount of uniform, &c., worn by a Bokhárian *Sarbazai* foot soldier.

Having entered the ranks of the infantry, the recruit is enrolled for good and all in the army, from which no sort of circumstances will release him, and in which every offence and dereliction of duty are visited with severe chastisement. The sole exit from such a voluntary bondage is either by flight to a great distance, so as to avoid being caught and

Particulars relating to the present condition of the forces of Bokhára.

The *Sarbazais* or infantry branch.

Pay, equipment, &c.

Permanent nature of service.

tortured, or by coming to terms with the Company Commander, who, for a pecuniary consideration, is frequently willing to return his subordinates as dead, or to substitute another man to whom he gives the name of the individual desirous of quitting the service. Formerly these frauds were largely practised, but, since 1878, the Amir has put a stop to these malpractices, by condemning to starvation in prison, his younger brother Barat-Bek, for receiving, during a period of seven years, the pay of a thousand *Sarbazais* under his command, who in reality were not in existence. The pay of the company and battalion Commanders has been considerably reduced, and is now only procurable according to the number of such *Sarbazais* as are present on every occasion of drill or other instruction.

The service of the infantry *Sarbazais* is not heavy. It consists of a

**Routine of service.** 3 hours-parade of all the battalions daily, except Wednesdays and Fridays. Besides these they have to attend the Amir during his summer trips to Kárshi and Shahr-i-Sabz. There is no guard duty.

The Bokharian soldier, however, who is fond of his own house, and of the occupations of agriculture and trade, is wearied in such a service. He leaves his house unwillingly at early dawn to mount his ass and proceed to the appointed muster in the town of Bokhára. He has no liking for his tight infantry uniform, and he positively grumbles when the Commander-in-Chief, or Topchi-Báshi, takes it into his head (which he does very seldom) to order out the battalions during spare  $\frac{1}{2}$  hours for practice in file-firing with blank cartridge. With what satisfied activity, too, does the *Sarbazai* return from his duties to his home, as he urges on his donkey with his bayonet. Especially dissatisfied is the soldier with his camp life, during which he may be absent from 1 to 3 or 4 months, and spends all his spare money in the hire of a mule or horse without which he could not accomplish a march of 20 *versts* ( $13\frac{1}{3}$ rd miles). Then again he may be frozen in camp since they only issue a round cotton tent for all seasons to every 10 *Sarbazais*. His bedding consists of an inferior felt. This, with his iron cooking vessels, is carried on the camel or cart which he has to hire from the Government that he serves.

After roll-call the battalions lazily move out from Bokhára on the march after uttering the choicest, but of course secret, oaths against the Amir as the sole author of such movements.

The *Sarbazais* plod along dolefully in groups, without any sort of formation or order, without too any observance of military regulations, halting wherever they think proper. But these halts are more often regulated by the owner of the hired ass, who wanders on by the side of his animals, taking care that the soldiers do not ride in pairs and that they do not fasten more than 2 firearms, with their appurtenances on one animal.

Traders accompany Bokharian soldiers on the march, and provide the necessary articles of food, &c., and this they do however long the march may be. Out of his daily pay of 10 *kopaikas* (about 3d. in English money) each *Sarbazai* has to provide himself with three

biscuits and a cupful of peas ; he has also to drink tea which costs him 40 *kopaïkas* (about 1 shilling) a lb., and he may too, if he pleases, buy for himself a melon or grapes, and the quid of tobacco which all Bokhárians use. The military traders pitch their booths on the flanks of the camp, which thus presents the appearance of a gipsy or caravan encampment, because, although the infantry tents are arranged by battalions, the rows are not regular and the intervals are blocked up with horses, carts, camels, mules, &c., &c. Indeed, the sole signs of a military encampment appear in the high Turkish drums that are suspended over the piles of arms, whilst at sunset the fact becomes more patent because all the battalion Commanders parade about in front of the Amir's tent, to the strains of discordant music, and again, at nine o'clock, as also at sunrise, the trumpeters sound the tattoo and revéille, in almost the same key that is in use by Russian infantry.

The camp life of the Bokhárian soldier, without any occupation other than the ordinary company or battalion

#### Camp life,

drills, manual and sword exercises, column formations, marching past, &c., is extremely monotonous on account of its daily sameness. In winter, to the same kind of existence, are added those physical sufferings entailed by want of fuel, there being no way of heating the soldiers' tents except by charcoal pans, a mode which is very expensive, or by faggots, to which the men go and help themselves from the nearest garden—a proceeding not without risk—or which they have to buy at exorbitant rates from the more opulent Communes. It is not surprising, therefore, that as soon as the *Sarbazais* hear of the speedy return of the Amir to Bokhára, they are all on the *qui vive* as to when the day of marching will be fixed, and as soon as this is known, they forget all discipline and dependence on their superiors, and roam along in irregular order, both horse and foot, getting over in this way it may be 60 *versts* (40 miles) or more in the 24 hours. The artillery also

#### Bokhárian Artillery.

always accompanies the Amir, and they have 14 large copper or brass guns,\* that were saved from the fight and brought back in some sort of serviceable condition. These guns, on their primitive, shapeless and heavy carriages, are always placed in front of the Amir's tent, and are guarded by tall sturdy Persians, clad in long green uniform Kaftans, and girt with swords in leathern scabbards, their sole armament. The artillery form a separate company of 300 men, and although they are entertained for this service alone, in practice this is not the case, for they merely have to harness two pairs of horses to each gun and to take about, but not to use, this smooth-bore battery, since for the last 12 years no Bokhárian artillery have fired even one blank cartridge. It is useless, consequently, to question the "Topchi-Báshi," or Commandant of Artillery, as to the system on which his men are taught, and yet this old

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\* The Amir's son, the Beg of Hissár, has 6 field guns of the same pattern.

Bokharian General will not hesitate to tell you, "our artillery works on the English model," introduced, be it remembered, by the instructor, Abdi Samat, whose name we have already mentioned.

Before finishing with the artillery we must add that, in addition to the above mobile battery, there are stored in the citadel of Bokhara 20 large copper or brass howitzers, 40 copper and cast iron mountain guns, and 15 copper mortars of various calibres. All these are unmounted and remain uncared for (although in charge of a special *Topchi-Bashi*, or Commandant of the Citadel), except on those days when the Amir visits the fort on his return from his various tours.

#### Parked Artillery.

If we say, too, that the artillery company knows how to drill in two ranks, and to bring their swords to the "Carry;" that the complement of the battery varies greatly, and that the number of horses is in proportion to the needs of the Beg who is in charge, we shall have said all regarding the artillery of Bokhara that there is to be said, except that an artillery such as this, without any bursting charges, is of very poor merit indeed.

Although service in the artillery of Bokhara is considered a more honourable calling, the soldier receives the same pay as his infantry *confrère*, and also the same number of stripes on the occasion of any breach of discipline.

Service then in the artillery may be said to be only attractive to the Bokharian because, when not on the march, the man is perfectly free, and when marching he is mounted on Government horses that are harnessed and saddled by the Beg who is in charge. On the other hand for the hire of an ass from Bokhara to Karshi (150 *versets* or 100 miles) the infantry soldier has to pay to the *Kirokeshi*, or attendant, the sum of two *roubles* (about 5 shillings), an amount that the poor Bokharian finds it difficult to get when his pay (military) yields him only ten *kopaïkas* (about 3d.) a day.

Since then the infantry *Sarbazai* finds it so difficult to exist on the four *roubles* (10 shillings) paid to him monthly from the Amir's treasury, those of them who are near Bokhara, and who have no property of their own, eke out their earnings by some sort of handiwork or petty trading, or by taking service in Caravan-Serais. Many, too, after espousing the two lawful wives, take them to Tashkent where they establish them in licensed houses; such of course do not return to Bokhara.

The condition of the Bokharian infantry soldier is indeed such as to render the probability of his bettering himself in the service to be very small. Happy does that *Sarbazai-alaman* consider himself who receives the *Yarlik*,

#### Grades in the Bokharian Army.

or sign-manual of the Amir, appointing him even to the first rank of *Churagasi*, a position that may perhaps open out to him the road to further elevation to the ranks of *Mirza-bashi*, *Djivachi*, *Karaul-beg*, *Mirakhur*, (captain), *Oksoba*, *ishik-aga-bashi*, *Bii*, *Datkha* (General), *Parmanachi*, *Divan-begi*—all

of which were instituted by Timur and are conferred in the present day on both the civil and military classes of Bokhara. But ordinarily, the Company commander can only hope to rise to the position of battalion Commandant, and the battalion Commandant to that of *topchi-bashi*, such promotion being very rare because it is only conferred on nine officers of the company, and amongst these at high prices, and by auction, except in the case of death, or when the calling away of an individual to another office causes a vacancy in the grade.

The vacancies amongst officials of rank are, as a rule, conferred on the relatives of the company and battalion commanders, of the Begs, or of the Amir generally, that is, on persons for whom there are those who are able not only to make verbal request but money payments. In like manner the further rising in rank is by and through the influence of those about the court, by corruption, by solicitation, and, only in rare instances, by personal intrigue or in some sort of service to the Amir which calls for espionage.

The Bokharians say that it is difficult to get from the lowest grades to that of Karaul-Beg, but that having done so, the posts of company or even battalion commander, or a place in the administration, may follow.

The 4th rank is important for Bokharians in that it brings with it Court dignity as well as more substantial gains, such as the bestowal of a knife mounted in gold, and a waist band made of Kashmir shawl. The Karaul-Begs are proud of their title as they receive from the Amir a commission with the title, "Mubarizat-panah," the "warlike," and their wives, or Begas, and their sons, or Begi-Jans, are addressed as nobles. This fact to wild Uzbaks and Sarts is, of course, so attractive that every *sipahi* thinks only of the time when he too may become a *Karaul-Begi* or even an *Ishik-aga-Bushi* and be addressed in the Amir's name as "Amirat-panah," or as a "reigning" personage. Such good fortune, however, usually only falls to the lot of the sons of favourite Begs, Kazis, &c., who almost always receive at once the rank of *Karaul-Begi Mirakhur*, and even of *Toksaba*, irrespective of, in some cases, their youthful appearance. By such privileges they come under the observation of the Amir and attain to vacancies amongst the battalion Commanders although they may never even have seen a regiment on parade.

It is only in the rarest instances that battalions receive their company commanders from amongst the number of the most distinguished, the most zealous, the most devoted, and incontestably the most hopeful servants of the Amir. But this perhaps can scarcely be otherwise, since not to be trusted is to be despatched at once to a subterranean prison or *zinda*, if not indeed to a worse fate.

There are five *Esauls* or fuglemen attached to the battalion commander, and the duty of these men consists in marching in front of the battalions with a stick in their hands with which they dress the ranks or enforce the orders of their superior, who gives all his orders by signal

to the trumpeter. This man, therefore, has constantly to run after the battalion Commander, even though he be careering about the field, as is generally the case.

All the stick bearers,\* trumpeters and musicians (*baja*—consisting of drummers, reed players, cymbal players, &c., &c.), elicit some sort of respect from the rank and file, but a line is drawn at the camp followers and others who are held to be on a footing not merely with the soldiers but with the humblest caste.

The outward distinctions between the several grades are very marked. The recruit of three months' service appears in his native dress. The *Dog-Bashis*, or squad Commanders (of 10 men), are distinguished by their badges (worn generally on a red coat) or long white ribbons down the back and on the shoulders and breast. The *Amaldars* are clad in long white cotton *kaftans* and carry only a sword with which they salute and go through the various motions, standing always in one rank 4 paces in front of their respective companies. The stick bearing fuglemen (*esauls*) are to be seen running up and down the front dressed in ordinary robes and bearing long thin sticks. The trumpeter, clad in a blue sort of coat, sports Russian Subaltern officers' epaulettes. The musicians stand on the left flank of the battalion, and their dress consists of blue cloth coats and low sheep skin hats. The Company Commanders strut about in long cloth coats, either grey, black or cinnamon coloured, with one row of buttons, and Russian Field Officers or Surgeons' epaulettes, high sheep skin hats, and wide leathern trowsers. The battalion Commanders appear on parade in long bright velvet coats, embroidered with gold thread on the arms and breast, and without epaulettes. Their trowsers are of cloth—their hats are low and made of beaver skin—their swords are fastened to their waist belt. Last of all there is the *Topchi-Bashi*, or Commandant of both infantry and artillery, who is adorned with a gold embroidered velvet coat, with two rows of six buttons on his breast, General officers' stars and epaulettes of Bokharian manufacture, a golden sword and gold lace belt, which are the yearly gift of the Amir.

All this form was introduced after the Irdjâr engagement, and since the year 1880 the addition of two silver general officers' stars has been made to the ornaments of the Company Commanders by the orders of the Amir, with what object is not known.

Greedy of all ornamentation, the Bokharians are still more avaricious of money grants, and these the military hierarchy has so contrived that service in the higher ranks is certainly both attractive and alluring.

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\* The complement of a Bokharian battalion is as follows: 1000 rank and file, 56 officers, 5 *Esauls*, 1 clarion player, and 16 musicians. Author.

As we have said, each private soldier or *Alaman* receives four roubles (about 10s.) a month in quarters, and seven (17/6d.) whilst on the march. The *Dog-Bashis*, *Esauls*, trumpeters and musicians are paid

at the same rate. But with the *Amaldars* of the first grade, pay commences to be issued  $\frac{1}{2}$  yearly at rates commensurate with those formerly allowed for one year's remuneration, on the following scale: *Churagasis* 48 roubles (about £6), and 144 *puds* (5184lbs.) of wheat. *Mirza-Bashis* 56 roubles (£7), and 192 *puds* (6,912lbs.) wheat. *Jivatchis* 72 roubles (£9), and 240 *puds* (8,640lbs.) wheat. *Karaul-Begis* 96 roubles (£12), and 400 *puds* (14,400lbs.) wheat. *Mirakhurs* 120 roubles (£15), and 480 *puds* (17,280lbs.) wheat. *Tok-Sobas* 280 roubles (£35), and 640 *puds* (23,040lbs.) wheat. *Ishik-Aga-Bashis* 400 roubles (£50), and the same quantity of wheat. *Biis* at the same rate of pay but with an allowance of 800 *puds* (28,800lbs.) wheat. *Datkhas* 800 roubles (£100), and 1,500 *puds* (54,000lbs.) wheat.\*

The daily issue of pure silver money is called *talaban* and it is given out at stated periods. The allowance in kind, or *hallya*, is received from the *Ziyafat-Beg* according to lists furnished yearly to the Amir. In place of grain from the *Kheraj* tribute, money can be substituted by agreement.

In the case of the highest ranks, beginning with *Mirakhur* (Captain), by special favour of the Amir, a rental or *tankha* takes the place of the *hallya*. This may amount to five times the quantity of the allowance in kind. In place, too, of the *talaban*, a state mill is sometimes conferred, and this brings in an income of 3 times the value of the recipient's allowances.

The receiver of a rental has to give for each yearly impression of the Amir's seal, on the deed of gift, tax at the following rates: For irrigated and tilled soil, 3-10ths. from all crops gathered in, 3 roubles and 60 *kopaikas* (about 9 shillings) per *tanap* (3-4ths. *desyatina* or 2.86 acres) whether for fruit gardens or vineries, and one rouble 20 *kopaikas* (3s.) per *tanap* of clover fields. Such a farm is either sold outright by the proprietor or managed through the medium of his own people. Complaints of oppression are never heard of, because any abuse of the kind is sure to be followed by the withdrawal of the grant.

Besides the various fixed yearly allowances, the private soldiers get four roubles (10s.) per annum as a marching ration, and to the *Churagasis* and *Biis* are issued, on the same account, 8 and 60 roubles (£1 to £7-10. respectively). The promotion, too, of any officer to a higher

\* On the basis of detailed elicited information, we believe the average yearly allowances of the following grades to be as noted:—Company Commanders 800 roubles (£100). Battalion Commanders 3,000 roubles (£375). Commanders of 100—600 roubles (£75). Colonels of Regiments 4,000 roubles (£500). The Commander-in-Chief 12,000 roubles (£1,500). Non-Commissioned Officers 300 roubles (£37-10). Besides their allowances, whilst on the march, the rank and file receive extras as follows:—Non-Commissioned Officers 3 roubles (7-6d.), Company Commanders 60 roubles (£7-10). Battalion Commanders 100 roubles (£12-10) per mensem. The whole of these allowances are paid in silver and gold, Bokharian money. Author.

rank is marked by the bestowal of a *dastar-khan*, or personal allowance. The proportions of this gift vary according to circumstances. For *Churagasi* the value is 12 roubles (£1-10), for *Karaul-Begis* 40 roubles (£5), for *Tok-Sobas*, or field officers, 80 roubles (£10), for *Bis* 100 roubles (£15), for *Datkhas* 200 roubles (£25). But the gift is balanced, 1stly, by the obligation of making offerings to two of the Amir's Aides-de-Camp or *Udaitchis*, who take from the newly promoted officer according to his rank, 2ndly, by the feasting with quantities of sweetmeats and sugar all those who make their appearance with congratulations to the recently promoted individual. If we consider that a person promoted, say to *Mirakhur*, is expected to entertain all ranks from *Churagasi* to *Diwan-Beg* inclusive, it will not be difficult to calculate the vast expenditure involved in addition to the 40 roubles (£5), which a *Mirakhur* is expected to give to the Aides-de-Camp, for the Amir's commission to the newly conferred rank.

But the *Mirakhurs* in their turn also have recourse to like profits. If they be in the position of Commander they can opportunely take from each soldier under them 5 *kopaikas* (3d.) a month, for the company standard, which is made of strips of cotton web on a long wooden pole.

Each battalion has five companies or *Yuzas* and the strength of each Battalion and their units. company is 200 men, and every battalion, in addition to the battalion standard, which is the gift of the Amir and always in charge of the commander, but not under a guard, has five standards of various colours as follows:—that of the right flank company is white, No. 2 company has a red one, No. 3 sky-blue, No. 4 yellow, and No. 5, or the left flank company, has black, yellow and red mixed. These standards, or *tugs* as they are called, are in charge of the company commander, and in drill order are placed on the right flank of each company, whereas the battalion standard, with its inscriptions from the Korán, is taken out only in time of war.

The camp life of the infantry soldier is in war time precisely the same as in time of peace. For every ten men a cotton web tent is provided, also one felt for bedding and one over-coat. For the carriage of these, and of the soldiers' cooking pots, a camel is hired at the rate of 20 *kopaiks* (6d.) for every 8 *versts* (5½rd. miles) of road traversed. Nothing is paid when halting for either hired animals or carts, although they may be kept for a whole year.

The load of a camel with the baggage, &c., of a squad of ten men, is generally heavy, because the soldiers add thereto their arms and uniform, preferring to march in their own tattered coats and Astrakhan hats, whereby one can so readily distinguish *Sarbazais* out of a varied crowd of turban-wearers, whether city or village inhabitants.

The Armament of the infantry is of one uniform pattern and quality, and consists of smooth bore arms with badly fitting bayonets. The officers are armed with swords and revolvers.

Infantry Armament.



The infantry fire arms are manufactured in the private workshops of Bokhára, and are bought by the Government for 4 *roubles* (10s.) a piece. The spherical or conical bullets for these, as well as cartridges and powder, are also of local manufacture. These are kept in the arsenal of the fort and are not served out because instruction in musketry never takes place; indeed, in the course of a year, battalions only fire off a few blank cartridges on two occasions.

If we further add that the soldiers uniform is likewise made up in the Prime Minister's private establishments, and that the Officers have to make up their suits at their own expense, nothing remains to be said about the interior economy of the Bokhára infantry.

Before we speak of their formation and of the strength and cost of maintaining all arms, we deem it useful to make the reader acquainted with another branch of that army, *viz*: the Cavalry of Bokhára.

Our information regarding the Cavalry, although in great detail, will not, we suppose, occupy many pages in this description, because this branch of the service, besides losing all its importance after the battle of Irdjár, has remained in precisely the same condition as it was in during the reign of Tamerlane. Then as now the Cavalry consisted of the *halabatirs* and *Khasabardars* of the regular army, and the *Naulkars* or Volunteers who obeyed the summons of war and kept themselves and their horses at their own expense so long as the war should last.

The ranks of the standing cavalry are filled by levies, under the orders of the Amir, of all mounted natives, chiefly Uzbaks, who may express a desire to serve and who make their appearance for service with the *halabatirs* with a horse, lance and sword. These individuals throughout their service wear their own style of dress, consisting of robe, leathern trousers, Uzbek boots with sharp toes, and turban or sheep-skin head dress. Neither have the *Khasabardars* any prescribed uniform, but they, too, have to bring horses with them, and to every two of their number is issued a cast-iron falconet, or swivel gun, which weighs 50lbs. With this crew it is supposed that with this heavy fire-arm accurate shooting can be made, from a rest, up to a distance of 700 yards. In addition to the falconets, the *Khasabardars* are armed with their own sabres, or else with a heavy weighted iron mace.

Thus it was up to the occupation of the town of Sámarkand by a detachment under General Aide-de-Camp Von Kaufmann in 1868, but during the last ten years, the thoroughly peaceful relations between Russia and Bokhára have led the Amir Muzaffar Khán to the full conviction, that the Russian administrative authorities in Turkistán always intend to place confidence in him, and that the period of the various illusions, in which he indulged prior to the Irdjár engagement, have passed away for ever. From the same date the new relations, and the knowledge of his own weakness, have convinced the Amir of the

Reduction of the Bokhárian Cavalry.

inexpediency of maintaining a standing contingent of *halabatirs* and *Khasabardars* as he did formerly.

Eight years ago, therefore, a considerable portion of the regular cavalry was reduced by orders of the Amir, and orders were given at the same time that vacancies were not on any account to be filled up. Such measures were very reasonable because in peace time the Bokharian Cavalry had always been very lazy, knowing neither their drill nor the requirements of home service. It would have been strange, then, to continue to pay Uzbaks for having their names recorded in rolls, whilst they were really either sitting idly in their villages, or else were engaged in agriculture.

Excellentlly acquainted with the spirit of his people, and aware of the uselessness of his cavalry, the Amir decided on not suppressing this body all at once, lest he should excite murmurs amongst an armed mass which had long been kept up at the State expense, so he reduced its strength by degrees, and the same process is going on now. Thus at one time, in the Bokharian dominions, there were 10,000 *halabatirs* and 4,000 *Khasabardars*, or a total of 14,000 regular cavalry, which was located in turn at the fortified points on the Amu-Daria,\* at Kárshi, Kermina, Zioldin, Nurat and the Kárshi Steppe, along the Caravan road, all of which were subject to constant inroads on the part of Turkomán robber bands.

Moreover, these *halabatirs* and *Khasabardars* have no organisation, and can practise no military evolutions, so that amongst the general body of the native population they are perfectly undistinguishable. Even at a guard house it would be difficult to distinguish the individual in a robe and turban who calls himself the "Amir's *halabatir*," from any of the other undoubtedly cowardly races composing the Amir's Uzbek forces.

Forming as they do a separate body, these *halabatirs* and *Khasabardars* are grouped in regiments (*dastas*) numbering 500 men. Each regiment is under a *Sarkardé* appointed by the Amir from amongst his devoted and meritorious servants who hold high rank. Such Commanders received yearly pay and other gifts, according to the grade they are in.

The entire duty of a *Sarkardé* consists in keeping the rolls of his men, and in holding himself in readiness to proceed whithersoever he may be ordered.

Liable to a call for foreign service for a period of three months at a given point, each *halabatir* and *Khasabardar* receives yearly 12 *batmans*† of wheat for his horse (or 60 roubles, (£ 7-10 in money), and 30 roubles (£ 3-15), compensation in case of the loss of his horse (*asp-murda*), but these allowances go as a rule into the pockets of the centurions.

\* At Chardjui, the residence of the Amir's son, 5,000 *halabatirs* were always quartered.

† The Bokharian *batman* = 8 puds = 288lbs. Author.

*Parade formation of the Army of Bokhára.*

To say anything about the parade formation of the troops of Bokhára is for us a most difficult task, difficult because the impression produced by an inspection of the infantry, which on one occasion was afforded to us by the *Topchi-Bashi*, has remained in our minds so ineffaceably, and so resembled a military comedy in its genuine originality, as likely to call forth a smile from even the most serious spectator.

We will endeavour, however, to here depict what we chanced to see in Bokhára of the parade of four battalions.

The formation is in two ranks. The companies take their places in the battalion according to numbers, counting from the right. The sizing is fairly regular, and is also from the right, and the dressing takes place from this flank under the superintendence of the company commander. The manual exercise, with the customary words of command, is performed according to the old Russian system of instruction. The formation of company columns, deployments on the command "Front Form," square formations, the advance in skirmishing order in two ranks at close intervals, the rear-rank passing through the front and kneeling down, &c., comprise the whole of the drill of the Bokhárian troops. These movements are carried out by signals with extreme indolence and inactivity, and without any knowledge of their meaning. Since 1866 the training of the Bokhárian infantry has been carried on according to the Russian system of 1860.

The Bokhárian infantry, according to the remarkable code of regulations which we received from the Amir himself, is formed of those orderly persons who know the recognized forms of prayers (*nawaz*) and the *Sharihat*. It is imperative that the *Sarbazais* should be so arranged, according to height, that one should not exceed the other even by a grains' size. When the Commander (*muallim*) gives the word "Attention," all must take their places at once, and on the command "Eyes right," all must align themselves like a wall. On the word "Steady," the *Sarbazai* must look 16 paces to his front and remain in this position intently, even though a snake should commence to bite his nose. This is a sacred duty of the *Sarbazai* because, being under arms, his head belongs to his sovereign, whose order is *Vodjib*, and since it is the Divine Word it is *farz* or holy. He, therefore, who does not adhere to the *Vodjib* subjects himself to capital punishment. In order to carry out a salute the battalion commander gives the word "Sub-officers, draw swords, two paces forward;" upon this all the Non-Commissioned Officers, holding their swords in a perpendicular position, move out to two paces in front of the battalion, whilst the position of the Commanders is 4 paces in front of their respective companies. When the command "Present arms" is given, the *Sarbazais* counting "one", "two", carry their arms perpendicularly

in front of their eyes as an indication that each man is a sacrifice to his Sovereign. The salute of the battalion Commander requires that he should point his sword down-wards and raise his left hand to his ear, during which the band strikes up the "salute," or "tablisalaam." After presenting arms the commands follow—"Sub-officers sheath swords," "Sub-officers advance." On the latter order being given, those named, file past and resume their places. The training of the *Sarbazais* requires that he should parade for two hours daily, except on Friday. His exercises during these parades are very useful in strengthening the muscles and consequently the development of endurance when marching. The "slow march" is not much used in instruction parades, the word "march" only being given, upon which care has to be taken that all move off in time on the words "left," "right." If it is desired to increase the pace the word is given "by lengthened pace, march." For rapid movements the order is "run! march."

The principal feature in the training of the Bokharian soldier in the use of his firearms is the charge. In this the following commands are given—"draw out cartridges," "bite cartridges," "load," "draw out ramrod," &c.\*

Fencing is likewise considered an important part of the training of the *Sarbazais*.

If the danger is sudden and great, the Bokharian troops are formed into squares. On the command "battalion form company squares," No. 1. Company halts, No. 2 wheels to the right, No. 3 to the left, and No. 4 forms the rear face, thus forming a "Kurgán", or fortified body with four guns at the angles.† If the guns are used, the faces open out a little, closing in rapidly after each discharge, so as to hide the gun and prevent the enemy bringing his fire to bear on it. The force of one gun is held to equal that of a thousand *Sarbazais*.

After a successful fight, the commander sometimes says to his *Sarbazais*—"well done children," and the recipients of such praise have to answer,— "may you prosper."

It is very doubtful whether the Amir knows any thing about his infantry, since he has no idea of military work and never holds inspections of his troops, contenting himself with meditation, and with the fact that on Fridays all the battalion and company Commanders, as well as all the Sirkars and Ministers, according to Bokharian custom, salute him with a low obeisance, after which they partake of the hospitality of the palace.

In conclusion of this sketch it remains for us to say that the whole of the Bokharian infantry consists of 13 battalions, which are thus located. In Shahr-i-Sabz two battalions—in Báljuan and Darwáz one battalion—in Kuliáb and Hissár  $\frac{1}{2}$  battalion each. The remaining 9

\* All the words of command met with are corruptions of the Russian official expressions and commands. Author.

† How a battalion of five companies forms square the regulations do not say. Author.

battalions are quartered in Bokhára, and each year six of these accompany the Amir in his journeys between Kárshi and Shahr-i-Sabz.

We have already communicated the scale of pay of the rank and file of the infantry and cavalry, as well as of the company and battalion Commanders, of the *Sarkardés* and Centurions, of *halabatirs* and *Khasabardars*. And we have means of accurately estimating the receipts of the higher grades, such as *Djivatchis*, *Mirakhurs*, *Bís*, *Datkhas*, and of *Parmanatchis* or full Generals.

With all these figures then before us, we may reckon the cost of a battalion of 1,000 men with 22 camp followers to be as follows:—Pay of the soldiers 48,000 *roubles* (£6,000), uniform and equipment of soldiers 5,000 *roubles* (£625), repair of tents and felts (for bedding) 1,000 *roubles* (£125), pay of 50 officers 15,000 *roubles* (£1,875), other allowances 1,000 *roubles* (£125), pay of five company commanders 4,000 *roubles* (£500), other allowances and rewards 400 *roubles* (£50), pay and allowances of battalion commander 3,600 *roubles* (£450), repairs of arms 200 *roubles* (£25). Thus the yearly maintenance of one battalion would amount to 78,200 *roubles* (£9,775). So that the yearly cost of keeping up the 14 infantry battalions of Bokhára equals 1,064,600 *roubles* (£1,33,075).

The maintenance of the 14,000 regular troopers (*halabatirs* and *Khasabardars*) equals 840,000 *roubles* (£1,05,000) plus 6,000 *roubles* (£750) for casualties amongst the horses. To these figures have to be added the yearly pay of 140 Centurions, *viz*:—84,000 *roubles* (£105,000), of 28 Commanders, 112,000 *roubles* (£14,000), plus 14,000 *roubles* (£1,750), on account of rewards to the *Sirkardés*. Consequently the yearly cost of the cavalry force comes to 1,056,000 *roubles* (£1,32,000).

For the 300 artillerymen 14,400 *roubles* (£1,800) are annually expended, plus 1,500 *roubles* (£185) for their uniform, 1,200 *roubles* (£150) for rewards, 16,000 *roubles* (£2,000) for the feeding of 360 horses, 800 *roubles* (£100) for the pay and allowances of the company Commander. Total ... 33,980 *roubles* (£4,247-10).

For the yearly maintenance of the three hundred men of the body guard, the charges are thus classified :—Pay, with marching allowances, 18,000 *roubles* (£2,250), uniform 2,000 *roubles* (£250)\*, extra allowances 1,800 *roubles* (£225), pay of 12 officers 6,000 *roubles* (£750), pay and rewards of two Company Commanders 2,600 *roubles* (£325). Total ... 30,400 *roubles* (£3,800).

The yearly pay of the Commander-in-Chief is 13,000 *roubles* (£1,625).

Consequently the ordinary yearly cost of the whole Bokharian Army is 2,197,980 *roubles* (£2,74,747), plus an expenditure of 1,20,000 *roubles* (£15,000), on account of movements of six infantry battalions, the body guard, and six guns, during five months of the year between Bokhára and Kárshi.

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\* The uniform of the body guard is as follows :—long red cloth coats, leathern overalls, and beaver skin caps. The yearly cost of it is about 15s. per head. Author.

If it be asked for what object the Amir, Muzaffar Khán, spends such a substantial amount on his army out of his budget of six million *roubles* (£750,000),\* it must be answered that the bulk of the forces is merely kept up for home defence arising out of the Kárshi insurrection of 1868, which nearly terminated in the success of the heir apparent, Abul Malik, and his active adherent Djurabai (formerly Bek of Kilat), who had schemes of upsetting the Amir, and of again beginning a fruitless struggle with Russia.

But for the future we must not look on Bokhára in the light of the irreproachable relations which have existed with us during the past ten years. On the contrary, after a close acquaintance of the whole side of the life of the Bokhárian people and government, we are ready to assert that Bokhárian sincerity, both present and future, is and will be in exact proportion to our military condition in Zerafshán, and especially so with regard to our military *strength* in that province. We should then, having in view the examples in the history of the political life of the Khánate of Bokhára, of government revolutions, of the falling away of vassal dependencies without any warning or premonitory symptoms, on no account forget the historical education of its people who are ready always, under a false show of devotion and of friendship, to conceal the most violent antipathy, and to take their vengeance on the first favourable opportunity.

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\* We can assure those to whom the figures above given may appear too high, that they are taken from accurate information which we had intended to communicate in our account of the Khánate of Bokhára as soon as we had collected the necessary particulars regarding the southern and eastern borders of Bokhára, which no Russian has yet visited. Author.



## IV.

### "FROM CANTON TO RANGOON."

*Text of a Lecture delivered at the Rooms of the United Service Institution of India, on Tuesday, the 5th September 1882,*

BY

MR. R. COLQUHOUN.

*Sir D. M. Stewart, Bart., Commander-in-Chief, in the Chair.*

The Council of this Institute has done me the honor to invite me to give an account of the journey which I have just accomplished across China from Canton to Rangoon. It was with pleasure that I acceded to the request, and the pleasure has been all the greater as I am able to count amongst those present this evening several old and valued friends, who have taken a kindly interest in my expedition, from the beginning.

The subject of exploration in Indo-China had been for many years of my stay in Burma a subject of great interest to me; but it was really the wonderful narrative of the great Venetian traveller, Marco Polo, studied by me closely when I was attached to the Government of India Mission to Siam in 1879, that decided me to attempt a somewhat ambitious journey in Indo-China.

In studying the subject, I became aware how rich a mine lay almost untouched, and that not only in the matter of geography, ethnology, and general points of interest vitally, *viz.*, trade extension from British Burmah, a knowledge of this region was of the greatest importance.

The objects of my journey were:—

- (i).—To collect geographical information which would prove of value to the Royal Geographical Society and to the Geographical world at large.
- (ii).—To amass general matters for a book of travel which would prove of interest to the public.
- (iii).—To enamine Yünnan and the country south west of it, to our south east Burman border, *viz.*, the Shan States; to ascertain the possibility or otherwise of a trade route in this direction, and the prospects of trade.

It was not till I went on leave in 1881, that I found it possible to execute my project, although all arrangements had been made. Passports granted by orders from Peking, and instruments, were awaiting me at Canton, and an officer of the Chinese Consular Service, at Canton, was to accompany me. The Chambers of Glasgow, Manchester and Liverpool, all held meetings and took interest in the journey, and the Glasgow Chamber voted a sum to assist me in the survey and report on a trade route between South West China and Burmah. My late companion, Mr. Charles Wahab, a civil engineer in London, volunteered for the duty of assistant on the expedition, and was ready in a week.



We left London on the 6th December, reached Canton on the 20th January, and got away, after the usual difficulties, on the 5th February. My Consular friend was, most unfortunately, not allowed to come, as his services could not be spared, and Sir Thomas Wade, H. B. M. Minister at Pekin, warned me, officially, of the danger of attempting to cross the China frontier to Burmah. I was, therefore, compelled to cast about for a competent interpreter, and, after various unsuccessful attempts to secure the services of a suitable man, found one at last in the person of Mr. Hong Bing Kaw, B. A., a Chinese gentleman, thoroughly acquainted with English, and with a good knowledge of Mandarin, and some acquaintance with Cantonese. He had been employed by H. B. M. Minister at Pekin, as private secretary, and had also been in the office of the Colonial Secretary at Singapore. He was highly recommended to me by friends at Hong Kong, and as he was most enthusiastic, he seemed just the man I required. The Consul at Canton most kindly gave me, as second Interpreter, a subordinate of his Consulate, who was well acquainted with Mandarin and official etiquette and was a Cantonese. It was imperative to have interpreters knowing Cantonese and Mandarin also. After great difficulty we managed to prevail on a cook and cooly boy to accompany us as personal servants. All these men, it is needless to say, had to be very highly paid, for the Chinaman will only venture into unknown regions when heavily paid.

Our proposed route lay up the Sikiang or Canton river, to south-west Yunnan, then across south Yunnan to Ssu-mas, at the south-west corner of China. From there I intended to make my way through the Shan States by what I might consider the best route to Burmah.

The exploration of Cooper in 1868, Margery in 1875, McCarthy, the Missionary, and Captain Gill in 1879, and Count Czesenzy in 1880, all dealt with a totally different country. The only journeys made by Europeans, in the regions we were about to traverse, were:—

- (i).—The daring journey of Macleod in 1836 from Moulmein to Kiang or Xieng Hung, close to the China frontier, made on behalf of the Government of India.
- (ii).—The French expedition of 1867-68, which, after terrible hardships and difficulties, succeeded in accomplishing *the* greatest exploration ever done in Indo-China, *viz.*, their journey from Saigon to the Yang-tze. The journey lost to France two valuable lives, *i. e.*, De la Grée and de Carné.
- (iii).—The expedition from Tongking up the Songea or Fleuve Range, and through Yunnan to Yang-tze, by Dupiers, in 1869-70.

The journey, as accomplished by us, may be divided into two parts *viz.*:—(i) The Canton river, and (ii) Yunnan.

The Canton river we found to be, with slight improvements in the channel, navigable for some 400 miles above Canton for light draught steamers of about 4 feet, though none are allowed to ply. In the upper portion, numerous rapids, of a very fierce character, and gorges, prevent

navigation, except for shallow boats, such as ours, drawing some 2 feet. The river is one of most unusual beauty and would alone well repay the artist or geologist. The main features of the journey through the provinces of Kwang-tung and Kwang-si, through which we passed, were (i) the insecurity of the river against robbers—(ii) the marked animosity of the people towards foreigners—and (iii) the numerous fine cities fast falling into decay. The river is considered so dangerous that a cordon of gun boats patrol it but can hardly be said to afford any great security. The hatred of the Western was shown in the hooting of the people, the cries of *Fanqui-lo* (foreign devil), and collection of mobs wherever we landed, and finally in the issuing of a proclamation offering 200 *taels*, equivalent to about £ 60, for each of our heads. It was with difficulty that we got the boatmen to proceed. We had to adopt complete Chinese costume, even to the pig-tail, and confine ourselves to the *Ho-tau* or river ferry, in order to escape attracting notice. A proof of the dangers of these provinces is that no missionary, whether Roman Catholic priest or English, has dared as yet to attempt settling in these parts, although they are found in all the provinces north of these.

The ruined cities, with the remains of once magnificent *yamens*, or official residences, courts, temples and guild-halls, prove incontestably the former affluence of these cities. Whence did it come? Not from the provinces themselves, for Kowang-si, at any rate, is a poor and mountainous province. It *entirely* came from the important carrying traffic from Yünnan, driven by the Mahomedan rebellion northwards to the Yangtzi river, and is a complete proof how rich the provinces must have been to support so important a river traffic.

The province of Kwang-tung is a much richer and more thickly peopled province than Kwang-si, which is very mountainous, the cultivable area small, and people intensely poor. Many aboriginal peoples are found in West Kwang-si, and, amongst these, curious customs prevail, one of which is a novel way of making engagements. The young unmarried people of this tribe stand on either side of a valley at their New-year, and the ladies toss a colored ball to the other side. Whoever catches it is the lucky man. It would seem rather a dangerous way of proposing, but we were told that the fair ones have such precision that they never make a mistake!—The most quaint custom is said to exist, which might upset the ordinary routine of our life if introduced. In Kwirchan, in one tribe, the husband, after a child is born, takes to bed for 30 or 40 days, while the wife looks after the out-door work.

The people of Kwang-tung are mostly Chinese proper, known in the south as Cantonese and speaking the Cantonese dialect. But in Kwangsi, the aboriginal people predominate, especially away from the cities lying along the river bank, and a Cantonese cannot understand their dialect. The provincial dialects differ so much indeed that they may, for practical purposes, be called distinct languages. The measures of distance vary as much as the dialects, and we soon learned that the *Li* (statute measure of China) was an unpleasantly variable quantity. It varies with the character of the ground, whether up or down-hill, and still worse, with the state of the weather. We were constantly

told, later in Yünnan, that a certain distance down-hill was 30 *li*, and up 50 or 60, while in one case we learnt that a days march was 50 or 80, according as we started at daylight or later!

The crops are principally rice, ground-nuts, tobacco, and beans, along the river, and cassia and certain kinds of timber are also objects of trade. Salt of a very coarse quality comes overland from near Pak-hoi, a treaty port on the Tonquin Gulf.

At the navigation limit of the Canton river, Pe-Sê, or Pak-shik, we left our boat and began arrangements for our overland march. Here we met with a most serious misfortune, which went near to prevent our further progress. Our head interpreter—a highly cultivated gentleman, who spoke English and German admirably, and who quoted Alfred de Musset, turned out to be by no means adapted to exploration work. He complained of want of courtesy on my part, but the fact was that the nearer he came to the difficulties the less he liked them. We had never counted on his courage or his devotion, but we thought he would be ashamed to turn back.

The sight of the Yünnan hills, and the stories which the people we met told him of the hardships and dangers of Yünnan travel, was enough to decide him that we could not go on. The result naturally was that the 2nd Interpreter and servants refused to proceed, and all were for a return to Canton! Here was a cruel position! Persuasion was useless. However, the 2nd interpreter and servants were surprised when they found that we arranged for mules, coolies, and guide all the same, and I announced that *as they did not intend to come* we should alter our route and go to the Capital Yünnan-sen to invite the assistance of the Roman Catholic Missionaries. The result was the return of the head interpreter to Canton, the others agreeing to follow us *any where*. From that day we obtained a mastery which we had never had before.

On the 18th March we ascended the mountainous plateau of Yünnan, and entered upon a new country and a new life. With 10 mules and some 18 porters, we commenced *in grand seigneur*, as compared with later on, in our march to the S. W. of Yünnan. The march, some 40 stages, was executed with only a few days halt, and was a somewhat trying one, though brimful of interest. We marched on foot, as much for the purpose of economy as for enabling us to carry on surveying operations uninterruptedly. The interpreter, however, insisted on having a Sedan chair and four porters, and I was not in a position to refuse him at the time.

The features of Yünnan are those of a mountainous plateau, about 5000 feet high, with ranges of varying height. The country is very broken and hilly, interspersed with numerous rivers and lakes, with beautiful and fertile valleys. The Mé-kong, Salween, and Shweli are the principal rivers in the west, the Song-ca in the south, and the northern branch of the Canton river in the East. None of these rivers are navigable, and the rapids and heavy falls prohibit the idea altogether of their ever being made navigable. The South and West of Yünnan is the richest and most fertile. Indeed the North, a barren sterile region, is spoken of by the Yünnanese, as a sort of Siberia.

The plains and valleys throughout the South and West, have numerous fine cities, and innumerable villages, many of them of considerable size. The inhabitants of the cities and larger villages are mostly Chinese, *i. e.* they are the descendants of the Chinese of the lower eastern plains, and are called *Pentijen*. On the hill sides, and some of the smaller villages, are the aboriginal people, now entirely subdued by the Chinese. Some of them, however, such as the Lo-los, are allowed to have a Tu-ssü, or aboriginal chief, who is responsible and reports to the Mandarins. The crops of the valleys are rice, mainly as a food staple, while opium poppy is grown to a most surprising extent. Mr. Balew, in his luminous narrative of the itinerary of the Grosvenor expedition, hazards the conjecture that  $\frac{1}{3}$ rd of the cultivated area is under poppy. I should think he is within the mark. Sometimes 2 crops are raised but usually only one, a pea crop following the poppy. Sugar and tobacco are found also. Wheat, beans, Indian corn and potatoes,—the veritable European potatoe—are the hills corps.

The lower hill-sides are covered with small timber, the upper heights having fine pine forests, oak and cypress. Rhododendron, camellias, and wild roses covered most of the hill-sides when we crossed southern Yünnan in April and May, while wild raspberries, strawberries, cherries, and other English wild fruits, were to be found close by the road. Further north, pears, peaches, plums, and a variety of the larger European fruits, are found—we even saw the grape grown in several courtyards.

The principal exports are minerals, opium and tea, to the neighbouring countries, for which they receive back principally raw cotton from the Shan States, south and west; also English salt from Bhamo, while piece goods, and European articles principally, come all the way from Canton.

The question of trade-routes to Yünnan would have to be entered upon very fully to be intelligible, and time does not permit of this at present. I hope later in my book to enter upon this subject, and I hope to be able to shew that a trade route from south-east Burma to south-west Yünnan will most likely be found feasible.

On our way through the south we found the fine cities greatly ruined and deserted, but in the west—the stronghold of the Mussulman insurgents during the terrible 15 years war—it was still worse; civil war and the Yünnan plague—a most terrible scourge, resembling the famous plague of London in many respects,—have between them decimated the country and reduced the population from probably something like 10 millions to about 3 millions.

All the prefectural and sub-prefectural cities are rectangular and walled, after the usual Chinese pattern, and—although affording protection against the arms supplied to their soldiery, *i. e.*, usually, matchlocks with spears, lances, tridents—would offer little resistance against Europeans arms. The principal arms often *carried* by the soldiery, however, from our own observation, were an opium pipe and lamp for smoking, a fan and a square piece of cloth tied round the neck, with which the heated warrior mopped away the perspiration, when he happened to be on escort duty.

Each *Fu* or city of the 1st rank, has a prefect and *Chentai*, or Brigadier General, who is supposed to have a force of a thousand men at Head Quarters and more at out-posts. But in this—as in most other Chinese matters—imagination enters largely into the calculation, and when we asked—"but where are the 1,000 men?" the question was met by a smile which was expressive.\* The soldiery, however, are physically,—when not spoilt by opium smoking,—fine men and well clothed, and a striking contrast to the ragged rascals who form the soldiery of the plains.

When in the south, I was desirous to see something of the *Song-ca* river or Fluner Range, which the French are anxious to make the trade-route to Yünnan. Before leaving London we had learnt that an armed expedition was to ascend the *Song-ca*, and that a large vote had been made for the purpose. We got within a days march of Manhao, the place which the French wish to make the *entrepot* for the trade between Tong-king and Yünnan. It can probably be made the navigation limit of the *Song-ca*, though the river for some distance below will require to be improved by European engineering skill.—Unluckily we were compelled to push forward to Ssü-mao, the south-west frontier town, to attempt our passage through the Shan States before the rains set in. The French have since practically annexed a considerable portion of the river. From what we could learn, the Chinese are unlikely to view with indifference the supremacy of the French on these waters, and the second highest civil official of the province, the TOTAL of Yünnan was on a mission to enquire into the conduct of certain unruly tribes, as our informant told us. The unruly tribes, it is needless to say, were our channel neighbours.

The time is too limited to enter upon the details of the French movement in this quarter. But I believe, and I hope to prove later when I come to publish my book, that the expectations of the French will by no means be realized so far as regards the tapping of the Yünnan trade.

As far as Ssü-mao we were inundated with attentions by the officers to a degree that made us,—not being Tajen (great men) and certainly not looking the part—blush. We were received on arrival at large towns, interviewed, had *dinners a la Pekin*, the great compliment in Yünnan, given us, and the punctilious and wearying *convenances* of Chinese society were gone through, and many an amusing episode occurred.

But at Ssü-mao, we met with a reverse which was without doubt the work of the local officials. I cannot enter now upon the particulars of the episode; suffice it to say that pressure was brought to bear upon our party, guides, interpreter, muleteers and servants, and not one man would take one step south-wards from Ssü-mao. The entire story I hope to tell hereafter.

It may be imagined that it was a keen and bitter disappointment to us to turn from the Southern Shan States, northwards, which we were

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\* I need hardly say that the pay of the 1,000 men is drawn with minute regularity.

compelled to do, in order to reach Talifu and from thence gain Bhamo on the Irrawaddy river. I confess to a heart-pang, such as seldom comes to a man in his life time, when I took my last look at the hills southwards, which we ought to have been crossing.

It was with difficulty that we managed to get muleteers ready to take us up Western Yünnan. The Mandarins assured us that no route existed; there were no villages, no population, and the country was infested by the plague; and they pressed us to go round by Yünnan Sen, the Capital. Resolution on our side, however, made them give way, and we found the road which we followed, skirting the valley of the Papien river, wonderfully easy, fine valleys of large extent and fertility, and fine cities. The Mahomedan impress is here strong, although the plague has made sad havoc amongst the people. We passed deserted village after village, and town after town, all owing to the ravages of the war and plague. The architecture was markedly superior to any we had before seen, more solid and better finished. My friend and constant companion, Mr. Wahab, who had hitherto fought against sickness pluckily, had to be carried in a chair the greater part of the way.

After a 21 days march we reached the famous town of Talifu, and saw the magnificent sheet of water on whose western side it lies. This lake, some 30 miles in length, with a breadth of 9 to 12 miles, is hemmed in on its western side by a grand mountain mass, some 16,000 to 18,000 feet high, on whose crest, even in summer, snow lies. At the foot of this snowy sierra runs a narrow strip of beautiful, verdant cultivation, dotted with innumerable villages. The city lies some 10 miles from the southern end. It is a most magnificent sight. At either end, the west plain, between mountain and lake, narrows and is protected by strongly fortified towns. These strongholds are naturally assisted in each case by a river issuing from the lake. At Tali we found, greatly to our delight, an English missionary to whose mission, as well as the Roman Catholic, I carried credentials, and also—what we never expected—found a lady, his wife, the first lady who has ventured into Yünnan. Mrs. Clarke, a Swiss lady, nursed my companion and we luxuriated in a clean house and comfortable beds, while the amount of cheese, honey, milk, a bread like chuppaties, and other good things which we devoured, must rather have astonished them.

While at Tali, arranging for our journey to Bhamo—which we found no easy matter in the rains, at a season when no caravans were crossing—I had an interview with General CHANG, the *Titai* of W. Yünnan. This officer has the reputation of being a fair and just man,—indeed he is said to actually see that the troops directly under his command are paid. The General had served with Chinese Gordon and could not say enough in his praise. What he dwelt mainly upon, however, was his great honesty, a quality admired and lauded by the Chinese seemingly in proportion to its rarity.

At last, through the kind offices of Mr. Clarke, a resident of Tali, a Mahomedan Chinese, I believe, though he denied it—was found, who undertook for a large sum to deliver us at Bhamo, an agreement was

made, a portion of the sum paid at Tali, the balance to be given at Bhamo. This personal conductor, who supplied mules, guides and men for us, had been an officer on the Mahomedan side, and had distinguished himself, and gained a blue button by what he evidently seemed to consider a very creditable act, the surrender of a town by treachery. He told us, as we marched along later, how, when he saw things going wrong, he made advances to Yu-Kó, the Imperialist Generalissimo, and got as a reward for the transaction his button and the rank of Lieutenant in the opposite camp.

Our march from Tali westward, in heavy rain and over the worst route in Yünnan, was anything but a pleasure trip. On our way we met two Roman Catholic missionaries who received us with the greatest kindness, and talked—so it seemed to us—as if they had never been away from *la belle France*.

We had got as far as Yung-chang (the Vochan of Marco Polo), when an episode occurred which necessitated our return, and prevented our progress towards Tali. The Mandarin conductor was to find out at this place by which route from Yung-chang to Bhamo *he* would choose to take us. But on arrival he and the interpreter pleaded their inability to gain any information regarding the two routes. The old one, known as the Tapeng route, passing by Manwyue, had been abandoned this last dry season, and a new one, lying a considerable distance south and involving some 8 days additional journey, had been opened by LI-SI-TAI, the notorious Chinese Mandarin who was implicated in the Margary affair.—It was evident that this alteration of route and division of traffic had not been brought about without some weighty reason. For this reason I was determined that our conductor should choose the route and not myself. However, under the influence of the interpreter who did not wish us to cross the Chinese border, and would have liked to see us compelled to turn back a journey of some 4 months through China, with the heavy pay and perquisites he was drawing, he said he could find out nothing, and pressed *me* to settle which route we were to take. I saw it was useless to proceed with the interpreter whom we had and determined to turn back to Tali and seek the assistance of Mr. Clarke, the missionary at Tali.

The narrative of our difficulties, how our own mules were refused us, how we could not hire a single animal in Young-chang, with some 2,000 mules in the town, would take too long to tell.

We settled the matter by starting from Yung-chang one morning, having said nothing of our intentions, with nothing except some money in our pocket. My knowledge of Asiatic character told me that our men would probably follow. Sure enough, in the afternoon while we were seated at a roadside tea-house, up came the whole troop.

We had got 3 days journey back when we met Père Paul Vial, one of the R. C. missionaries whom we had before met. To shorten a long story, he volunteered to accompany us as interpreter, and as I knew he had already had the intention to attempt to visit Bhamo, with the permission of the *Monsignor* at Yünnan Sen, we most willingly accepted his offer.—A week was spent in buying a few mules and ponies for carriage, a matter

of difficulty, for neither the worthy Father nor ourselves had money. Our first step was to dismiss the interpreter and give him funds to find his way to Canton. The Mandarin muleteer was sick of the journey in the rains, and we cancelled his agreement and he returned to Tali.

In the West and through the South we saw a great deal of aboriginal tribes mostly unknown; and we were able to secure sketches of many and photos of some of them. The south and west are peculiarly interesting to the ethnologist, for here are gathered the greater number of the aboriginal people of Yünnan. We were fortunate enough to encounter some 30 out of the 48 said to exist. In addition to what we saw and learnt of them, I am indebted to Mr. Ciarke, of the China Inland Mission, for a most valuable work which he presented to me. It is the translation of an original Chinese manuscript, on "The aboriginal tribes of Kweichan," throwing much light on the habits, &c., of those of Yünnan as well.

The people of Yünnan present great and rapid changes in costume, language and character.—The aboriginal men are fine, sturdy and hardy; never touch opium, although they grow it, and compare most favorably with the Chinese of the plains. The women are well made, and active, having rosy cheeks and bright eyes, and a free gait, owing to their uncrushed feet. Better still, they are frank and fearless and have none of the prurient mock-modesty of their sisters of the 'lily feet.' After a toilsome journey by Yuug-chang and Teng-Yüch, we reached the Taping Valley. We had heard the most wonderful rumours—that war between Burma and England had broken out—that the new Brigadier General at Teng-Yüch had publicly given out that, while he was in command, no European should cross the Salween and so on. However, the threat of this anti-European warrior turned out to be nothing, like the other rumours.

At Manwyne we were lodged in a wretched hovel, the inn being occupied. On the evening of our arrival we found that LI-SI-TAI was in the village. I thought it judicious, seeing he was there, to send cards to him, according to Chinese custom, although we were by no means anxious to see him. He immediately, contrary to etiquette, came to see us before we visited him. He was very courteous, chatted away, and when he was asked about the old Taping road, travelled by Margary, Gill, and others, he replied that he supposed it was in the same state as usual, but that one could never count on the Kachyens, the hill people between Burma and China, in this neighbourhood. When asked regarding some disturbance on this road which we had heard made the road unsafe, he replied "Oh, the Kachyens are always killing each other!"

Next morning he left for Teng-Yüch. Luckily for us, we discovered soon after, not only that this road was unsafe but that it would have been certain death to have attempted to pass by it. It would seem that LI-SI-TAI had been sent some time before to Manwyne from Teng-Yüch, his Head-Quarters, to settle the quarrel which had been raised by the Kachyens on account of this diversion of the traffic from Bhamo, and the consequent diversion of traffic. He did so after the usual Man-

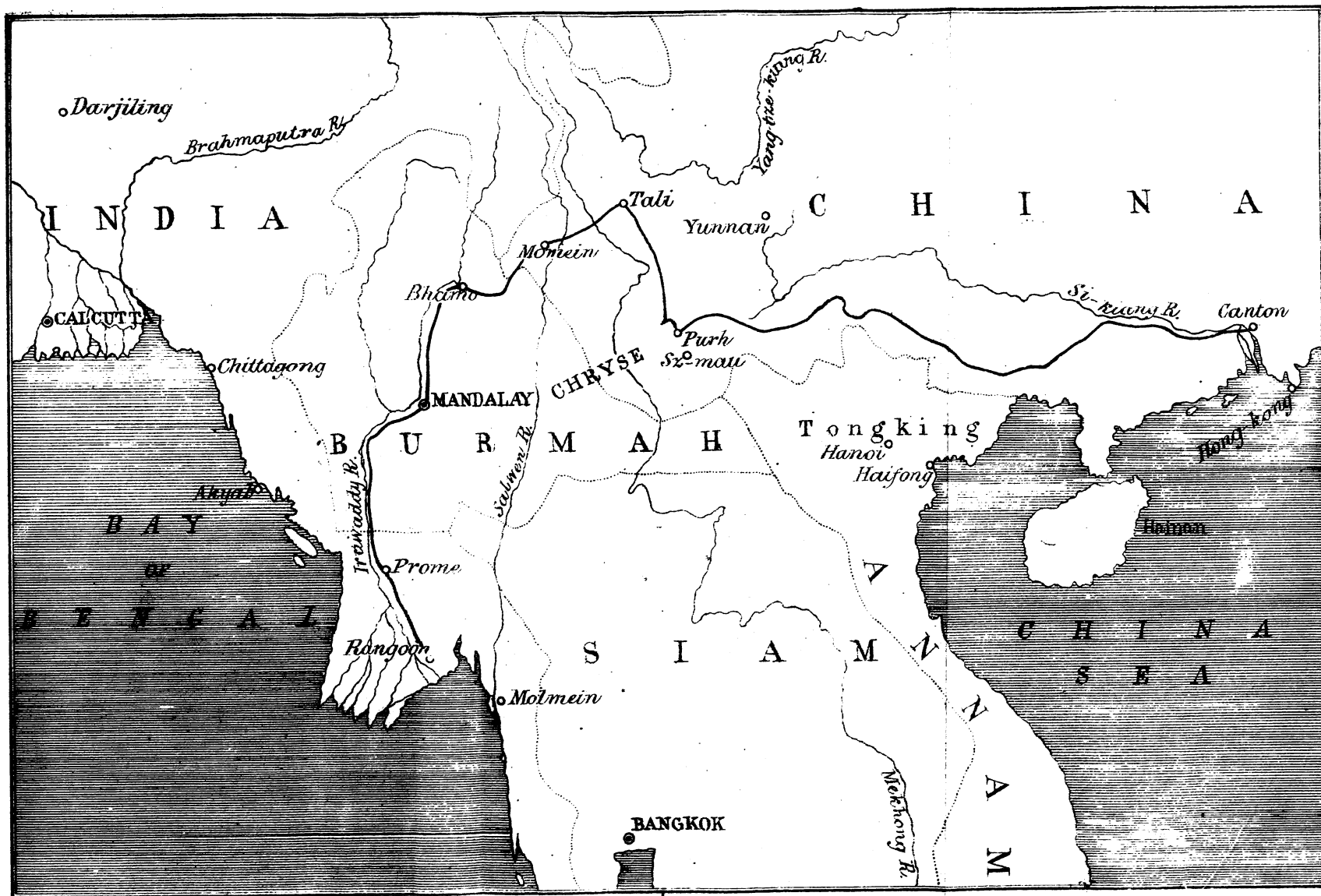


darinic method. Three of the Kachyen chiefs were invited to an entertainment at Manwyne, LI-SI-TAI pledged himself to re-open the old and close the new route; a certain sum was to be paid as indemnity for the loss sustained by the Kachyens, and presents were to be given to ratify the engagement. The chiefs came to Manwyne, were entertained by LI-SI-TAI, and immediately after, two were decapitated, their heads being exhibited in the Manwyne bazaar. It may be imagined after this that the road was not a particularly safe one to adopt. The fact is that a *Vendetta* is proclaimed by the Kachyens on this route against all comers from the China side.

It would have been madness to attempt this route, and I determined to get as far away from the scene of this episode as possible. We accordingly struck south some 5 days, and then crossed the hills by a winding track, from one Kachyen hamlet to another, till at last we reached Bhamo. This portion of our journey was one of great privation, exposure, and some danger. Worn out by fatigue, the want of food and exposure, for the march was made in heavy rain, with the poorest shelter, and for fare, rice and tea mainly, we gained the hospitable homes of the Missionaries in Bhamo. There we received every kindness from Mr. Stevenson, of the China Inland Mission, who shared with us his clothes, his food and such money as he had; indeed everything that was his. A few days at Bhamo of kindness and hospitality which was unwearying, then 12 days by steamer, brought us past Mandalay to Rangoon. Then I found myself amongst a number of old friends, who accorded us the welcome which our countrymen know so well to give to any one who has been travelling in unknown lands.

The only regret felt by me—and it was a keen one—was at the continued sickness of my friend. I am very sorry to have to tell you that he never recovered from the effects of the journey and that he was taken on board the last P. and O. Steamer, from the Calcutta General Hospital, most dangerously ill.

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V.  
REMARKS ON INSTRUCTION IN LONG RANGE FIRING,  
SEASON 1881-82,

BY  
MAJOR W. C. MACKINNON,  
*Assistant Adjutant General for Musketry, Bengal.*

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In 1881, the Government of India was pleased to sanction a special allowance of ammunition for the instruction of men of British regiments in firing at ranges beyond those marked on the backsight, and with a view to assisting in the useful conduct of this instruction, the following circular memorandum was issued by the Adjutant General in India.

“With reference to India Army Circulars, clause 96 of 1881, paragraph II, the following general principles for the expenditure of the ammunition therein sanctioned for instruction in long range firing with the Martini-Henry rifle, are published for information and guidance.

“2. The object of this practice is to teach as many men as can be profitably instructed, the use and power of the rifle at ranges beyond those marked on the flap of the backsight.

“3. With the view, therefore, of obtaining the utmost information on the subject, which is still one of experiment and inquiry, the details for carrying out the firing, the selection of the men, the number of rounds to be expended by each, must be left to the discretion of commanding officers; as also the description of targets and the distances over 1400 yards, both of which must depend very much on the nature of the ground available.

“4. It would be instructive to practise at an object fixed on ground prepared like a lawn tennis court, smoothed and plastered with mud, with the view of ascertaining the number of hits over a certain area, and of practically showing to the men the results of their fire.

“5. The effect of both volley and independent practice should be tested at known distances.

“6. To prevent erroneous ideas as to the use and value of this instruction, it should be carefully impressed on the men that it is purely an auxiliary fire, useful on special occasions, to cover an attack against masses, or in the attack and defence of positions, and that accurate and deliberate fire at short distances, combined with rapid advance, will alone defeat an enemy.

“7. A full report of the practice should accompany the annual musketry return.

“8. The sighting to be used is that explained in Adjutant General's Circular, No. 2654 E. dated 25th November 1878.”

Some notes of the practices and their results, selected as being considered generally successful, and at the same time capable of being briefly described, may prove interesting and useful:—

*2nd. Battalion Leicestershire Regiment—Jubbulpore.*

A prepared area 35 yards × 40 yards, with dummy guns as a mark to aim at:—

|                                  |                |                    |       |  |
|----------------------------------|----------------|--------------------|-------|--|
| 159 Marksmen and 1st class shots |                |                    |       |  |
| Volleys at                       | 2000 yards—per | centage of hits... | 10.69 |  |
| Independent                      | 1800           | " " " ...          | 19.91 |  |
| Volley                           | 1600           | " " " ...          | 27.04 |  |
| Volley                           | 1500           | " " " ...          | 33.87 |  |

Major Richards regrets he could not carry the instruction further with indifferent shots, to prove to the men the superior effects of the fire by skilled shots.

*2nd. Battalion Dorsetshire Regiment—Roorkee.*

A prepared area with screens representing a quarter column of six companies of 22 files.

Four sections of 20 selected men.

|             |                |                 |           |
|-------------|----------------|-----------------|-----------|
| Volley at   | 1600 yards—per | centage of hits | ... 44.62 |
| Independent | 1600           | " " " ...       | 63.50     |

Colonel Hughes attributes the higher results of the independent firing to the men having got the correct elevation by firing the volleys first; but I think it will be generally allowed that independent or individual firing at targets will beat volley; the real point is—which is better against an enemy who is returning the fire; under these conditions, volley, which admits of greater control, must be the better method of fire.

Diagrams showing the appearance of the ground and screens after each practice are given.

*2nd. Battalion Scottish Rifles—Cawnpore.*

A prepared area 48 yards by 26 yards wide, with a screen as a mark.

|                                    |                |                 |           |  |
|------------------------------------|----------------|-----------------|-----------|--|
| 10 Selected men from each Company. |                |                 |           |  |
| Volley at                          | 1700 yards—per | centage of hits | ... 38.21 |  |
| Volley                             | 1800           | " " " ...       | 45.78     |  |
| Volley                             | 2000           | " " " ...       | 27.75     |  |

*2nd. Battalion East Surrey Regiment—Dinapore.*

Prepared ground having a target 24' × 6' on it.

|                            |                |                 |          |  |
|----------------------------|----------------|-----------------|----------|--|
| 15 best shots per Company. |                |                 |          |  |
| Volley                     | 1500 yards—per | centage of hits | ... 4.16 |  |
| Volley                     | 1800           | " " " ...       | 3.33     |  |
| Volley                     | 2000           | " " " ...       | 2.83     |  |

by far the larger proportion of hits were on the target, from which I think there must have been some error in counting hits on the cleared space.

*2nd. Battalion Loyal North Lancashire Regiment—Allahabad.*

Tried a system of sighting prepared by Captain Nuthall, Deputy Assistant Adjutant General for Musketry, at 1500 and 1650 yards. All the bullets fell in an area of 50 × 30 yards. Trial will be continued when sights are perfected.

*2nd. Battalion Royal West Surrey Regiment—Peshawar.*

Area of ground 40 yards square. A screen across it and a flag as marks.

25 best shots of each Company.

Volley 1800 yards—per centage of hits ... 18·50

Independent 1800 " " " ... 22·50

Brigadier General Gordon remarks that the better sighting obtained in the first or volley practice may have aided the independent; but, as above remarked, the point is—what fire will be most effective in action. Independent does not admit the same degree of control or of keeping men steady as does volley.

*1st. Battalion York and Lancaster Regiment—Morar.*

Prepared area 40 yards × 18 yards, with a row of targets as a mark to aim at.

200 men in two Companies.

|             |               |                                |  | On ground<br>and mark. |
|-------------|---------------|--------------------------------|--|------------------------|
| 1st Company | { Volley at   | 1850 yards—per centage of hits |  | 10·60                  |
|             | { Independent | 1600 " " "                     |  | 14·80                  |
| 2nd Company | { Independent | 1850 " " "                     |  | 8·8                    |
|             | { Volley      | 1600 " " "                     |  | 4·6                    |

Average time of independent firing  $2\frac{1}{4}$  minutes; the first company was either more fortunate or more skilfully directed.

*1st. Battalion Leicestershire Regiment—Jhansi.*

Prepared ground 48 yards long and 8 yards broad—mark, screens intended to represent cavalry in "fours" on the march.

128 marksmen and 1st class shots.

Volley 2100 yards—per centage of hits ... 6·71

Independent 2100 " " " ... 9·21

*2nd. Battalion Devonshire Regiment—Jullundur.*

Area 30 paces × 50 paces. Target 33' × 6'. The firing was by Volley, Independent and Skirmishing, at distances between 1500 and 2000 yards, by the marksmen of the regiment.

2000 rounds were fired—416 hits on screens and area, or a percentage of hits to rounds of 20·80

*2nd. Battalion Cheshire Regiment—Peshawar.*

Prepared area 100 feet × 100 feet, with a screen 5' high across the centre.

Independent 1700 yards—per centage of hits ... 17·20

Volley 1700 " " " ... 18·80

Volley 1700 " " " ... 28·00

Volley 1700 " " " ... 3·20

*1st. Battalion Suffolk Regiment—Fyzabad.*

The targets consisted of 4 screens 33' x 6' placed at intervals of 33 feet—50 picked men.

|             |                                              |           |
|-------------|----------------------------------------------|-----------|
| Individual  | 1500 yards—per centage of hits on screens... | 19.52     |
| Volley      | 1700 " " "                                   | ... 16.96 |
| Independent | 1700 " " "                                   | ... 20.35 |
| Volley      | 2000 " " "                                   | ... 10.00 |

Nearly all the bullets struck the ground about the targets, covering an area of about 100 yards long x 60 broad.

Objection to Howard's sighting is that line of sight and line of fire are not parallel.

*2nd. Battalion Seaforth Highlanders—Lucknow.*

One screen 8' high x 40' long, on an area of 50 yards square.

Volley at 1600 & 1700 yards—per centage of hits... 5.60

Independent 1600 & 1700 " " " ... 2.10

Captain Howard's sighting defective—elevation insufficient, and line of fire and line of sight not parallel.

*1st. Battalion West Riding Regiment—Lucknow.*

Screen 9' by 40.' Skirmishing targets in front. 100 picked shots fired at distances between 1500 and 2000 yards.

Volley per centage of hits ... 9.90

Independent " " " ... 9.70

The hits counted appear to be those on the targets only, not on the prepared area as well, if there was one.

*1st. Battalion South Lancashire Regiment—Chaubattia.*

Target with added screen 40' x 6.' Area prepared 25 yards x 20 yards.

Volley 1650 yards—percentage of hits to rounds on screens and area ... 24.25

Independent 1650 yards—percentage of hits to rounds on screens and area ... 22.80

Major Howard's system of sighting was used by all with the exception of the 2nd Battalion Loyal North Lancashire Regiment.

From the above practice it appears evident that, so far as the rifle is concerned, small areas of ground can be rendered absolutely untenable, and in so short a time that the enemy, whether dismounted cavalry, unlimbered artillery, even infantry, must suffer severely before they could move out of the fire; but to obtain this effect from the rifle two other factors are required:—

1st. A quick and fairly accurate range finder.

2nd. And most important of all (because it is most difficult to secure), such a habit of control in both officers and men as will ensure steady deliberate fire; in the above practice the targets were not firing at the men. It is the hope of obtaining this essential in some degree that Volley firing is preferred to Independent or Individual, though it is allowed that it interferes greatly with individual skill. It may be said that the effect of fire in action is proportionate to the degree of control officers can exercise.

A certain number of range finders, the invention of Mr Bolton of Calcutta, and which promise well, will shortly be distributed for trial.

Major Howard has lately improved his system of sighting; he has added to the slider a jointed leaf which allows the line of fire and line of sight to be parallel and which folds down when the flap of the back-sight is lowered; these will be tried this season, but it is possible that more elaborate and more exact sights may be adopted in England.

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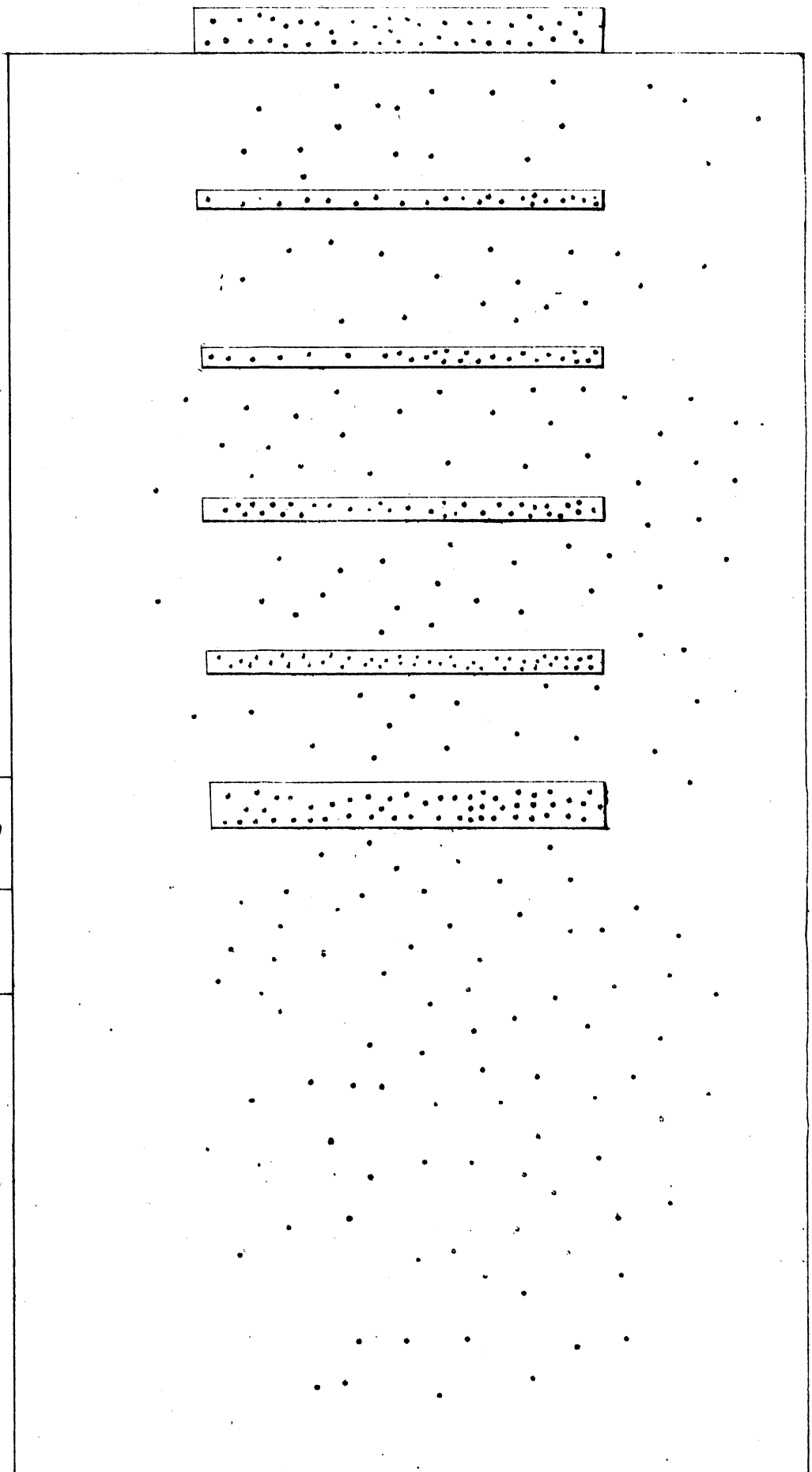


*Experimental Volley firing at 1600 Yards.*

*4 Sections of 20 Men, 10 Rounds each.*

*Prepared Ground 52 Yards by 30 Yards Screens 45 feet long 5.9 x 2.9 high.*

|                        |                                                                      |
|------------------------|----------------------------------------------------------------------|
| <i>Screens</i>         | <i>Hits</i> 172<br><i>Percentage of hits to rounds fired</i> } 21.50 |
| <i>Prepared Ground</i> | <i>Hits</i> 185<br><i>Percentage of hits to rounds fired</i> } 23.12 |



*Roorkee*  
*April 21<sup>st</sup> 1882.*

*W.P. Hodnett Major*  
*2<sup>nd</sup> Dorsetshire Regt*

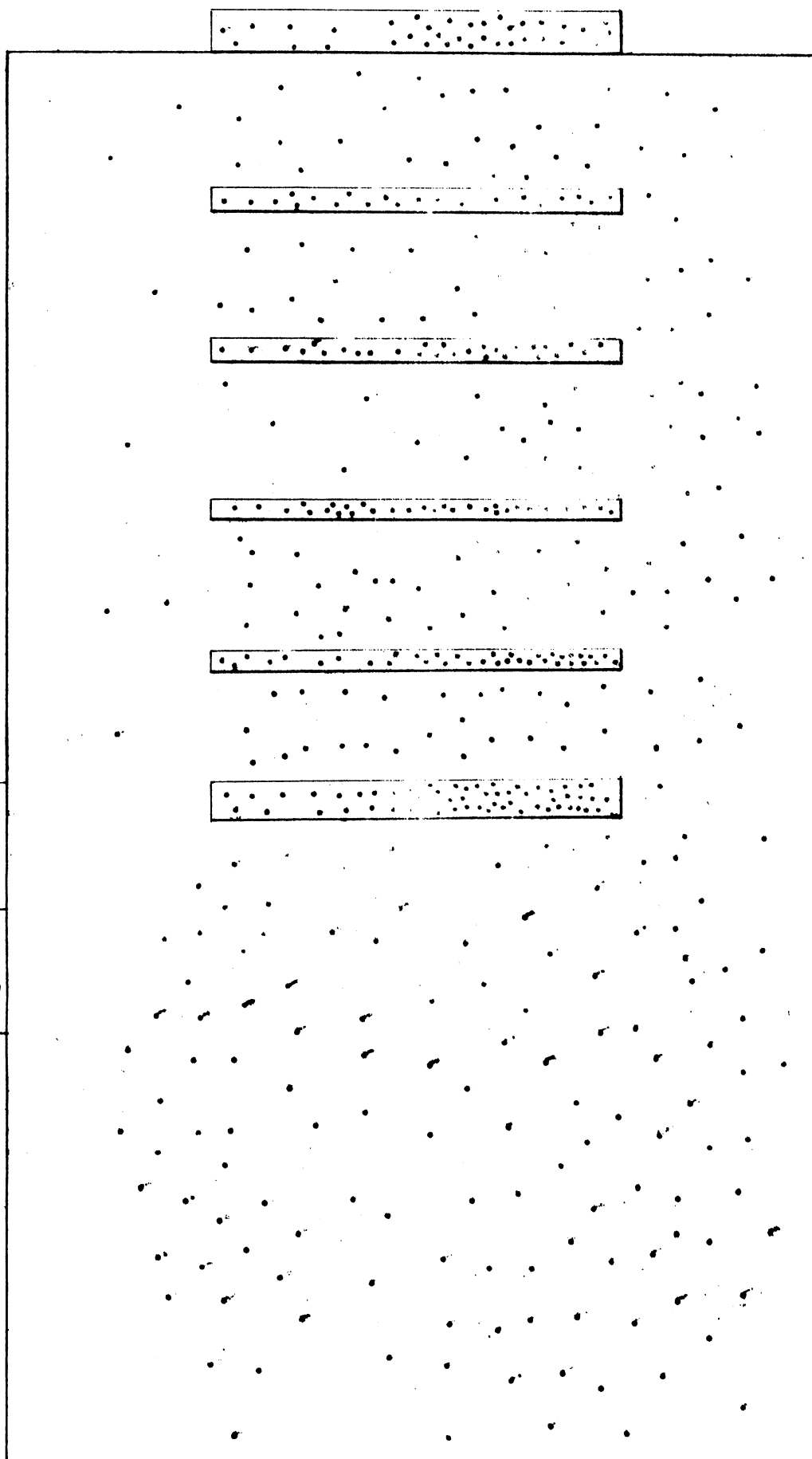


*Experimental Independent firing at 1600 Yards.*

*4 Sections of 20 Men, 10 rounds each.*

*prepared Ground 52 Y<sup>ds</sup> by 30 Y<sup>ds</sup> Screens 45 feet long 5' 9" x 2' 9" high.*

|                        |                                                   |
|------------------------|---------------------------------------------------|
| <i>Screens.</i>        | <i>Hits.....</i> 221                              |
|                        | <i>Percentage of hits to rounds fired</i> } 97.62 |
| <i>Prepared Ground</i> | <i>Hits.....</i> 287                              |
|                        | <i>Percentage of hits to Rounds fired</i> } 36.0  |



*Roorkee*  
*April 22<sup>nd</sup> 1882.*

*W. P. Hodnett Major*  
*2<sup>nd</sup> Dorsetshire Regt.*



## VI.

### BRITISH INFANTRY IN THE HILLS AND PLAINS OF INDIA.

BY  
CAPTAIN MARTIN MARTIN, R. E.

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It was generally supposed that the completion of the Railway system of India would lead to a completely new distribution of Military Cantonments, and that a few strategical points in the Plains would alone be occupied by British Infantry, the great bulk being located in hill stations, or at least on elevated plateaux where the strain of existence would be less severe and the troops would be more healthy and fit for service.

For many reasons this revolution has been very partially carried out, and during the past 10 years the increase in the numbers of Europeans in the Hills has been chiefly in details of regiments, the railways affording greater facilities for sending sickly men to Sanitaria, and public and private efforts having done much for the women and children. Sanitaria, for details of all regiments, offer a considerable number of objections, such as increased correspondence, separation of officers from their men, increase of staff at the Sanitaria who are taken from their regiments below, and a number of practical inconveniences which are well understood by regimental officers, and which have been much aggravated by the short-service system. Where it is possible to do so, an increase in the number of whole regiments quartered in the hills is a much more desirable end to aim at than the further development of Sanitaria. But here considerable difficulties occur—the hill stations are not conveniently placed on the lines of communications; on the contrary they are inconveniently situated on hill ridges only made accessible by great labour and expense, and many of them unsuitable for railway communication even in the future. Water supplies of all kinds, sites for building, ground for parade and manœuvre, are all obtained with difficulty. The neighbourhood is generally sparsely populated by a peaceful but dirty and diseased people, and the troops are of little use in such quarters, while they can be recalled with difficulty on emergency to the more probable scenes of activity. (I have omitted Cavalry and Artillery entirely from this paper as the want of forage and space generally makes the hills of North-Western India totally unsuitable to the great mass of these arms—mountain batteries being the only exception). For a station which combines all the disadvantages mentioned in an eminent degree, Chukrata may possibly take the palm; other stations in the North-East are perhaps more inconvenient to reach but are not so short of water, so entirely out of the world among tribes that require no garrison to control them, and in a district which appears to possess the smallest prospect of further development.

Searching, and searching in vain, for hill stations conveniently placed along great strategic routes in India, it is impossible not to regret the abandonment of Afghanistan. The passes of the Kurrum, the heights of the Khojak, and the slopes of the Safed Koh towards Safed Sung, furnish convenient sites for British Military occupation which would be looked for in vain in India, and give promises of development which it would be hopeless to expect from the older and out-of-the-way hill stations of India.

It is needless to say that the troops occupying such stations as the Peiwar Kotl, Safed Sung, &c., were profoundly dissatisfied and uncomfortable; dissatisfied since they all wished to be in front, and uncomfortable from the Cabul scale and the uncertainty of tenure of the locality. A permanent occupation and a line of rail-road would have obviated both objections.

It is too early, and it is not permitted in this journal, to speculate on the political probability of our again occupying Afghanistan with its well marked lines of communication, healthy uplands, and many favourable conditions, but, I think, in seeking for future hill stations for our troops, the ulterior development and usefulness of the locality should be kept in mind, and the distribution guided by a view to permanence, taking into account the probable contingencies of the future and avoiding the expenses and inconveniences of the past.

In the selection of a hill station it is hardly necessary that a permanent character should at once be given to it; still less so that the station should be prepared before the troops arrive; with fair conditions of wood and water it is quite possible for an infantry regiment, marching with light equipment but well supplied with tools, to get comfortably huddled in the few months of spring and early summer that precede the rains.

Should the station be afterwards abandoned, the country is put to no great expense, while the regiment is rendered more serviceable by a summer spent in healthy exertion and not on their cots.

The too early arrival of the Public Works Engineer, with his Budget Estimate, is a military misfortune.

Witness the station of Mian Mir.

It is currently believed that while a number of savants were discussing the comparative merits of this portion and that portion of the horrible waste, Sir Charles Napier, planting his sword in the ground, pointed to it as the centre of the future Cantonment.

A monument at any rate marks the supposed spot, and the very excellence of the "Pucca" buildings, including the very handsome Church, has prevented, it is supposed, the removal of the Troops to more favoured localities.

The arsenal and fortifications of Rawal Pindi are another unfortunate instance of too rapid permanency being given to a site carelessly selected. It would seem, therefore, advisable from these considerations:—

- 1st.—That, holding in view the probable wholesale redistribution of the army in the immediate future, no more permanent hill stations should be erected in out of the way districts.

**2nd.**—That every facility should be given to the erection of temporary quarters in the hills by the European troops themselves, pending events.

**3rd.**—In order that as many troops as possible may be spared from garrison in the plains, every effort should be made to concentrate the arsenals and magazines in a few strategic points, and to neutralize the power for mischief of large native cities and independent States.

The Volunteers have added 10,000 men to the available garrison of India, chiefly in the plains, and much might still be done to increase the numerical and actual value of this force. Possibly corps of naval volunteers might also be organized by the large shipping Companies. Every step taken in advance by the introduction of European Capital and enterprise into India is also a gain in Military strength, and allows a larger proportion of the regular forces to be withdrawn to the hills in peace, or to the field, in war.

India differs from all our other possessions in that all efforts made hitherto to found Military or other colonies have failed, and thus it serves as a constant drain on the human resources of England, and acquires from year to year only a very doubtful increase in stability, for which we have to depend mainly on the self interest of the natives themselves, and the ever present force of bayonets. It has been said that we have stopped just 10 degrees short of the Northern Frontier we should have obtained, and if by any means we could succeed in obtaining territory fit for colonisation, we should have gained a great step in advance.

Russian writers are not slow to twit us on the insular pride which, according to them, prevents us from assimilating and incorporating the peoples we have subdued. Their own powers of digestion are certainly stronger than our own, and their exclusiveness less, but the mixed European and Asiatic races in this country have certainly not been successful hitherto. In the harder races lying to the North and West, possibly a mixed breed might become a source of strength to us, and induce short service men to remain in the country after discharge.

Dismissing the larger social and political problems which bear on our military occupation of India, it might be useful to examine the ordinary life and occupation of British Infantry in such hill stations as we now possess. Generally speaking, these are profoundly unpopular with officers and men. It is not in human nature to continue to be thankful for a bearable climate during two years residence on an excessively dull and uninteresting hill top. The officers have less opportunity for cricket, polo and shooting, and to a great extent the men suffer from not either witnessing or participating in these amusements. The bazaar, also a favourite resort of the British soldier, is a very inferior affair in the hills, and the spur given by emulation with other troops in brigade is withdrawn.

Usually the ground is too steep to allow of much movement off the roads; generally there is a great want of shade and water, and after



having exhausted the fascinations of entomology, as represented by catching butterflies, the British soldier is generally content to retire to his cot and await the rum bugle.

The officers console themselves with whist. So great is the want of exercise and amusement in the hills, that regiments have been obliged to institute roll calls at five miles distance from their stations to tear the men out of their huts.

Of course there are the usual drills and exercises, musketry, &c, in the hills, and the rifle club, prize shooting, &c., but these occupations do not and cannot fill the whole, or the greater part, of the infantry soldiers time. In this respect Cavalry and Artillery are more fortunate, the work is more varied and active and the men enjoy better health.

A great many of these disadvantages disappear if the Regiment is marched to a new place, there to construct its own temporary shelter. Tools, materials and superintendence are provided, and every one is busy making the roads and buildings and providing for the Regiment. In this case all ranks take pride and interest in the work they are engaged in, and usually leave the station with regret, as well as in first class physical condition, with savings in the bank; the short service men have very probably learnt a trade or increased their proficiency in their old vocations, and, at any rate, they will leave the regiment with active and not idle habits, and be so much the better prepared to recommence a citizen life.

If the soldier is a considerable gainer by two years *active* life in the hills, so is the Government. The Government has saved a considerable sum in the invaliding account which would otherwise have been incurred, in the punkah coolies and other servants not required in the hills, and has in hand a regiment in fine order fit for any service. Against this must be set the Engineers' bill for roads and permanent buildings, the cost of carriage in relief, firewood, and often a high charge for water mules. These are mostly, however, charges incurred in the first instance in the plains also, but as new buildings for British Regiments are now chiefly confined to hill barracks, these continue yearly to figure in the budget, while a smaller outlay on original works in the plains is incurred, and is chiefly confined to schemes of water supply which are almost final charges. On the whole, the Government may credit themselves with a considerable saving, but the cost in some instances, where conditions have been unfavourable, has been such as to make the financial aspect in regard to establishing fresh hill stations one to be seriously considered.

If, however, the cost be limited to the working pay of the regiment itself when employed on roads and buildings in the hills, and to the supply of rough material, the greater portion of which, *viz.* the forest timber, being already State property, the expense to Government will be reduced to reasonable dimensions, while the benefit both to Government and the soldier will doubtless be greater. Any one, who has to witness yearly the extreme discomforts and the unbearable ennui to which the British soldier is subjected in the Indian hot weather in the

plains, must wish to see a larger number annually enjoying the climate of the hills. That residence in a hill station is not exactly a paradise, all of us also know ; but it is capable of being made an active and useful form of life ; and it is in the hope that hill stations may be multiplied and improved, and that discussion may possibly tend towards that object being attained, that I have ventured to put together these very incomplete suggestions.

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## NUMBER OF BRITISH TROOPS AND FOLLOWERS RESIDENT IN THE HILLS.

*General Abstract from 1870 to 1882.*

| Seasons. | Men.      | Women. | Children. | REMARKS.                                                   |
|----------|-----------|--------|-----------|------------------------------------------------------------|
| 1870     | (a) 6,107 | (d)    | (d)       | (a) Includes 887 men as working parties in the hills.      |
| 1871     | (b) 6,679 | (d)    | (d)       | (b) Includes 99 men from the Madras Presidency.            |
| 1872     | (c) 7,220 | (d)    | (d)       | (c) Includes 149 ditto.                                    |
| 1873     | (e) 7,633 | 646    | 1,243     | (d) The details of women and children are not recorded.    |
| 1874     | (f) 8,674 | 754    | 1,621     | (e) Includes 146 men from the Madras Presidency.           |
| 1875     | (g) 9,058 | 813    | 1,690     | (f) Includes 149 ditto.                                    |
| 1876     | (h) 9,150 | 839    | 1,810     | (g) Includes 150 ditto.                                    |
| 1877     | (i) 9,185 | 964    | 2,135     | (h) Includes 141 ditto.                                    |
| 1878     | (j) 9,163 | 829    | 1,863     | (i) Includes 198 ditto.                                    |
| 1879     | (k) 5,196 | 784    | 1,745     | (j) Includes 202 ditto.                                    |
| 1880     | (l) 6,917 | 754    | 1,718     | (k) Includes 129 ditto.                                    |
| 1881     | (m) 9,076 | 731    | 1,456     | (l) Includes 28 ditto.                                     |
| 1882     | (n) 9,630 | 684    | 1,405     | (m) Includes 1 man and 1 woman from the Bombay Presidency. |
|          |           |        |           | (n) Includes 1 man and 1 woman from the Bombay Presidency. |

## VII.

### PROPOSED SUBSTITUTION OF A CART FOR A WAGON FOR CARRYING THE AMMUNITION OF BATTERIES OF ROYAL HORSE AND FIELD ARTILLERY

BY

CAPTAIN E. B. STANDBRIDGE, R. A.

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AT different times the suggestion has been made by various officers, that the present system of carrying the ammunition of batteries of Field Artillery (in which term are also included Royal Horse Artillery batteries, the word "field" being used in contradistinction to "garrison" or "siege"), should be modified, the ammunition and spare stores, so far as might be practicable, being carried on two-wheeled vehicles, in place of on four-wheeled wagons as in the present equipment.

Introductory remarks.

The fact that the present wagon is too heavy for the requirements of the service when taken off good roads, has been proved by experience in both the late campaigns, and it occurred to the writer, that it might be of use if a short description of an ammunition cart, designed to take the place of the ammunition wagons, which at present form part of the equipment of field batteries, were set before them.

The cart described below was designed in the commencement of the past year (1882) at the Gun Carriage Factory, Fatehgarh, to which establishment the writer was then attached, to meet certain conditions laid down by the Inspector General of Ordnance.

This cart was to take the place of the second line of ammunition wagons, and the ammunition was to be carried in this cart, packed in boxes, which could be taken out of the cart and at once placed on mules, if the nature of the ground were such as to necessitate that mode of transport.

Conditions laid down for the cart and ammunition box.

As the cart was to take the place of the wagon, it was thought advisable to prepare a design by which the existing limber could be utilized; and the sketch shows a body of a cart set on and fixed to a limber frame of the present 9 pounder R. M. L. equipment.

Cart designed so as to utilize the service limber.

Description of the cart.

The specification of the cart states that "the body consists of a frame of sal timber 3 inches square scantling, with boarded floor and sides of 1 inch deodar plank." The sides are supported by stanchions "c" of sal, which fit into iron sockets bolted to the side framing. Head and tail boards are attached by strong iron hinges, and can be let down and held by chains "o" in a horizontal position. The rear of the body is supported by two

angle iron stays "a" bolted to the axle-bed of the limber, and it is secured to these stays by bolts and nuts "d." The front of the body is bolted to iron clips "b" fitted to the futchells of the limber. The head and tail boards can be taken off and fitted on to the pins "m" projecting above the sides, and will then form two seats, which might be useful in the event of the cart being required to transport wounded men off the field.

The ammunition box is made of 1 inch plank ; strong iron hinges pass completely round the box and over the lid ; to these hinges are attached links by which the boxes can be hung to the hooks of the pack-saddles of mules. The lid is fastened down by two screws which fit into brass sockets "n" shewn in the plan, the heads of these screws are recessed to receive the ordinary service key, by means of which they can be screwed home.

The box is further strengthened by iron bands and plates ; the latter are to prevent the box from being injured by the iron trees of the pack-saddles.

Each box will hold 6 shells, 6 cartridges in a cartouche, 1 portfire, 1 cylinder of friction tubes, or 1 cylinder of time fuzes, and a small box containing 4 percussion fuzes.

The cart will carry 12 of these boxes, and arrangements are made by placing battens on the floor, in suitable positions, to hold the boxes in their places and prevent them from shifting, when less than the full number of 12 boxes is carried.

Tools, intrenching, and other stores, carried on one cart. The following tools, intrenching, and other stores, can be carried.

*Spade, helved, common.* { The T head of the helve is secured by a strap passing through staples on the splinter bar, and the blade rests in loop "e."

*Hammer Claw.*—Carried in two leather loops "f f."

*Hook bill.* { The handle is secured by a strap passing through staples "g," and the blade rests in loop "h."

*Shovel, helved, common.* { Carried in a similar manner as the spade, but on the opposite side of the cart.

*Saw, hand, in leather case.* { The blade passes through a slot in the 2nd stanchion from the rear, and the strap of the case is fastened to a staple fixed to the side of the cart.

*Maul, wood.*—Strapped under the body of the cart.

*Posts, picket No. 4.*—Strapped under the body of the cart.

*Axes, pick.*—As at present carried under the limber.

*Box, tin, grease, half round*—Strapped to the axle-bed.

*Buckets, iron, field,* { 2 of these can be carried hung to the axle-bed,  
with lid. } as at present, on limbers.

*Handspikes, wood No. 1.*—Strapped to rear of body.

*Swingle tree.*—Strapped to splinter bar as at present.

*Axes, felling.*—In a similar manner as at present.

The drag and picket ropes, blankets and gear bags, could be carried in the cart on top of the ammunition boxes.

|                                           |                              |       |    |   |    |
|-------------------------------------------|------------------------------|-------|----|---|----|
| Weight of cart.                           | Weight of the cart, empty... | cwts. | 12 | 2 | 5  |
| Weight of 12 ammunition boxes, filled ... | ...                          | „     | 10 | 3 | 20 |
| Weight of tools, stores, &c. ...          | ...                          | „     | 1  | 0 | 16 |
| Total weight of cart, packed ...          | ...                          | cwt.  | 24 | 2 | 13 |

The cart above described is one constructed by placing a wooden

The cart altered from a limber compared with a new cart.

cart body on the iron frame of a service limber. This construction is, of course, unnecessarily heavy.

A cart of similar dimensions and shape, if constructed entirely new of wood, could be made lighter, while possessing sufficient strength for the conditions of service.

Such a cart has also been constructed at the Gun Carriage Factory, and weighs, empty, about ... cwt. 11-0-0

In this paper a description of the cart altered from a limber has been given, because of this cart, drawings and specifications were at the writer's disposal, whereas there were no drawings, &c., of the new cart available.

Any arguments which may be urged in favour of the altered cart, on the grounds of lightness and mobility, would also be applicable, and in a greater degree, in favour of the new cart. The altered cart may, by some people, be considered the more economical of the two, but this also is doubtful if every phase of the question be considered.

Box wood, ammunition, camel field, 9 pr. R. M. L. Besides

Description of a Camel ammunition box.

the mule ammunition box for field artillery, there is a camel ammunition box for the transport of ammunition on the backs of camels. It is believed that this box has been introduced into the service.

This box is somewhat similar to the mule ammunition box above described in shape and mode of packing the ammunition, but it is larger, and is furnished with chains and hooks by which it may be slung to the saddle of a camel.

This box will hold 9 shell 9 pr. R. M. L., with 9 cartridges and

Contents of the box. the proper proportion of tubes, fuzes, Dimensions and weight of box. &c. The dimensions of the box are as follows:—

|                               |                  |
|-------------------------------|------------------|
| Length 2 ft. 2 inches         | Weight.          |
| Height 1 ft. 0.625 in. ... .. | Empty—cwt. 0 2 4 |
| Breadth 0 ft. 9.25 in. ... .. | Filled— „ 1 1 23 |

Eight of these boxes, carrying 72 rounds complete, can be carried

Number of boxes carried in one cart. in one of the carts above described. Two boxes form a load for 1 camel.

Advantages of the proposed equipment.

Comparison of the ammunition wagon with the ammunition cart.

In the treatise on Military Carriages, &c., 1879, page 34, the weights of a 9 pounder R. M. L. ammunition wagon and limber are

given. :—

|                                                   |          |   |    |
|---------------------------------------------------|----------|---|----|
| 9 pounder R. M. L. ammunition wagon (body) empty, | cwts. 14 | 1 | 4  |
| Ditto ditto (limber) empty „                      | ... 11   | 1 | 14 |

|                                             |        |   |    |
|---------------------------------------------|--------|---|----|
| Weight of wagon (body and limber) empty ... | ... 25 | 2 | 18 |
|---------------------------------------------|--------|---|----|

|                        |        |   |    |
|------------------------|--------|---|----|
| Ditto ditto packed ... | ... 40 | 3 | 14 |
|------------------------|--------|---|----|

|                                                 |        |   |    |
|-------------------------------------------------|--------|---|----|
| Therefore, the weight of ammunition, &c., is... | ... 15 | 0 | 24 |
|-------------------------------------------------|--------|---|----|

|                                                |        |   |   |
|------------------------------------------------|--------|---|---|
| The weight of the proposed cart, empty, is ... | ... 12 | 2 | 5 |
|------------------------------------------------|--------|---|---|

|                        |        |   |    |
|------------------------|--------|---|----|
| Ditto ditto packed ... | ... 24 | 2 | 13 |
|------------------------|--------|---|----|

|                                                 |        |   |   |
|-------------------------------------------------|--------|---|---|
| Therefore, the weight of ammunition, &c., is... | ... 12 | 0 | 8 |
|-------------------------------------------------|--------|---|---|

In the case of the latter, the weight of ammunition and stores carried is nearly equal to the weight of the vehicle; in the case of the former, the weight of ammunition and stores carried is about  $\frac{8}{5}$ ths the weight of the vehicle.

If we compare the number of horses required to transport a certain

Number of horses required to transport a certain number of rounds. number of rounds, we shall find the same number required whether the ammunition be carried in wagons or carts. For 12 horses are required to draw 2 ammunition wagons which contain 108 rounds each, and 12 horses could draw 3 of the proposed carts which would each contain 72 rounds. So that in either case 12 horses would be required to transport 216 rounds.

But the 12 horses drawing the 2 wagons would be drawing

Comparison of the load drawn by the horses in each case. cwts. 81-3-0, while the 12 horses drawing the 3 carts would be drawing only cwts 73-3-11.

If these weights are reduced to lbs. for the purpose of comparing the loads drawn by each horse in each team, we find the 12 horses of the 2 wagon teams drawing lbs. 9156, or each horse drawing lbs. 763. On the other hand the 12 horses of the 3 cart teams draw lbs. 8271, or each horse draws lbs. 689.

Roughly estimated, the load of the cart horse =  $\frac{6}{7}$ ths. of the load

Proportion of load drawn by each cart horse compared with the proportion of load drawn by each wagon horse. of the wagon horse. But this method of calculating does not show the full advantage gained by having 3 carts instead of 2 wagons. It is well known that in a team of 6 horses harnessed two abreast, the pair of wheel horses does more work than either the other pairs of horses, and, therefore, are the first to be distressed when pushed.

Probably the work done by the pair of wheel horses in a team of

Proportion of work done in draught by the wheel horses, and comparison of the work done by a pair of wheel horses in a wagon team, with the work done by a pair of wheel horses in a cart team.

$6 = \frac{1}{2}$  total work done, or if a load of 4578 lbs. has to be drawn, the pair of wheel horses will draw 2289 lbs.. Similarly, the work done by the pair of wheel horses in a team of 4 horses is greater than the work done by the leading pair, but the difference is not so great as in a team of 6 horses. Probably a fair estimate of the work done by the pair of wheel horses would be  $\frac{3}{5}$  ths. of the total work done, or in this case each pair of wheel horses will draw 1654 lbs. By this mode of calculation, the load of the wheel horses of the cart is only  $\frac{3}{4}$  ths of the load of the wheelers of the wagon.

Even if it were considered that the pair of wheelers in the cart team were drawing  $\frac{2}{3}$  rds of the load, that would give the load drawn by each pair of cart wheelers = 1838 lbs., or the load drawn by the cart wheelers =  $\frac{4}{5}$  ths. of the load drawn by the wagon wheelers.

The superior handiness of a two-wheeled vehicle compared with

Superior mobility of a 2 wheeled vehicle. a four-wheeled, is so well known that it is not necessary to prove that fact.

Perhaps it will not be out of place to calculate the amount of force exerted by a horse when doing a certain amount of "work." To find the "work done" by any force, the force is multiplied by the space which the force traverses in a unit of time. The standard horse power adopted by Watt to measure the power exerted by a steam engine was that a horse could draw 33000 lbs. through a space of one foot in one minute.

This was considered to be the "work done" by the strongest London horses—see Bourne's Catechism on the Steam Engine.

On page 67 of Owen's Modern Artillery it is stated that, by experiments made at Metz, it was found that the force of traction varied from  $\frac{1}{20}$  th total load when drawn on fine turf to  $\frac{1}{10}$  th total load when drawn on ploughed land. If a horse walking be supposed to travel at the rate of 4 miles an hour, he will in one minute pass over a distance of 352 feet. To find what force a horse must exert when moving at the rate of 4 miles per hour in order to do an amount of work equal to 33,000 foot lbs. If the force of traction be taken at  $\frac{1}{15}$  th the load,  $\frac{1}{15}$  th being a mean between  $\frac{1}{10}$  and  $\frac{1}{20}$ . Let F. be the force of traction which it is required to find, then  $F. = \frac{33,000}{352} =$  lbs. 94 nearly, or a horse must exert a constant force of traction of lbs. 94 when moving at a rate of 4 miles an hour in order to perform work equal to 33,000 foot lbs. And as the load is supposed to be equal to 15F. the load will in this case = lbs. 1410.

But an artillery horse may have to move at a faster pace than a walk; he may have to travel over bad ground; he may have to remain in harness for a lengthened period, and on a campaign he may often have short rations, and, therefore, it would not be expedient to tax his power to so great an extent.



One half the above would be a fair load or 700 lbs.

This load agrees pretty nearly with what is laid down in Owen's Modern Artillery, and is less than what is assumed to be drawn by the wheel horses of either the cart or wagon ; therefore, the vehicle should be of still lighter construction, if the number of rounds of ammunition be not reduced.

The supply of Ammunition to guns in action.

The system of packing the ammunition in small boxes containing

Ready supply of ammunition. 6 rounds, with a proper proportion of time and percussion fuzes, appears to offer facilities as regards the supply of ammunition to the guns when in action,

if the gun limbers were fitted with similar boxes. The weight of one of these boxes packed is about 100 lbs. One box could, therefore, be carried by a man for a short distance. This idea was also set forth by Lieutenant Goold-Adams, in the R. A. I. prize essay, 1879.

In conclusion, the writer would urge that, though this subject has

The subject has received increased significance by reason of recent events in Egypt. been dealt with by several able writers within the past few years, and has been considered a matter of importance, it may be said to have been thrust upon the notice of every one by incidents which occurred during the late campaigns.

The mobility of field artillery has always been recognised as one

Mobility of field artillery an essential feature. of its most essential characteristics. As the power and number of draught horses which can be advantageously employed in a team may be considered fixed, the only possible means of increasing the mobility of a field battery is by diminishing the weight and unwieldiness of the vehicles. The weight of the gun and carriage cannot be decreased below certain limits without seriously diminishing the effective power. But there is no reason why the ammunition should not be carried in lighter vehicles.

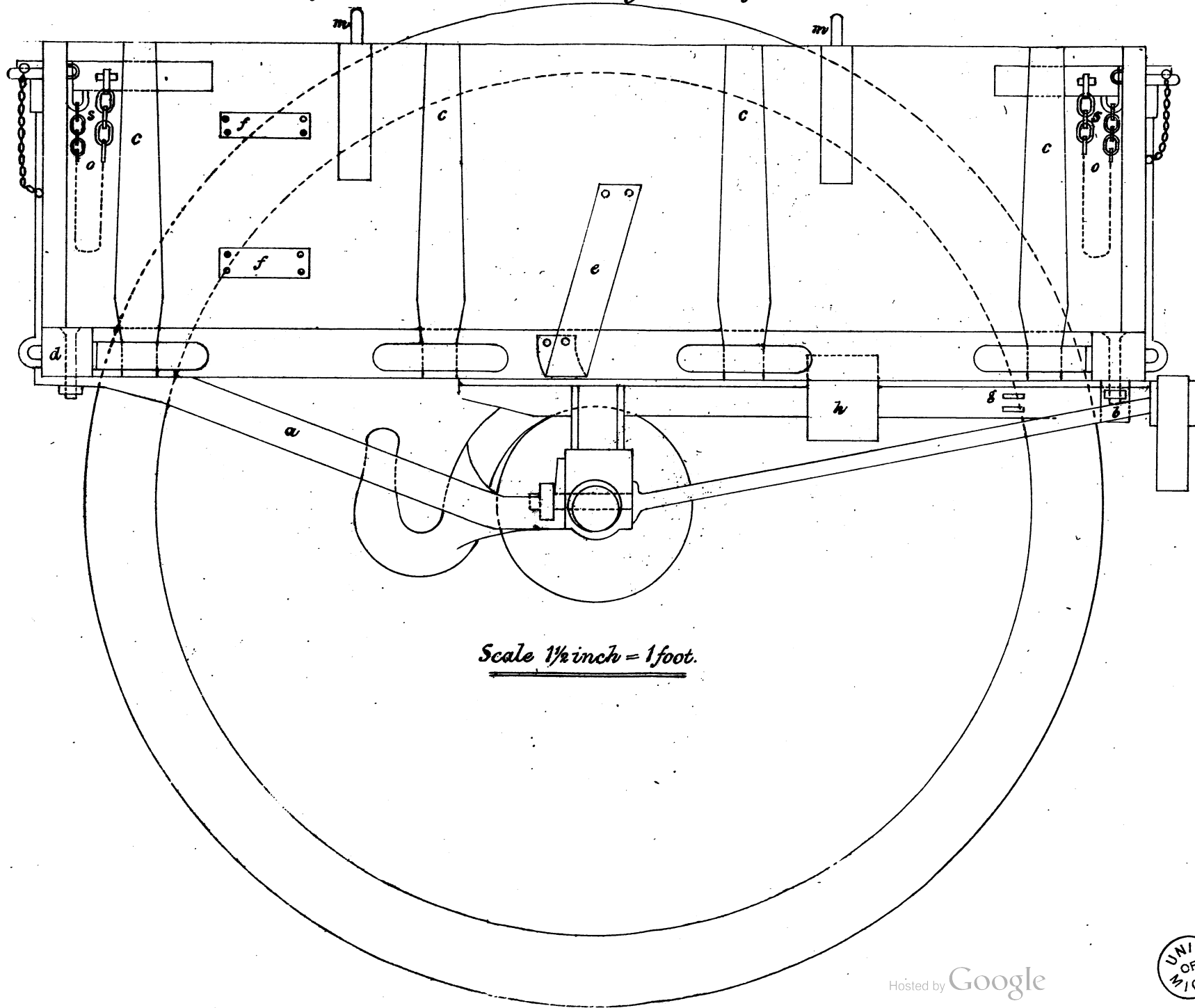
The employment of 4 wheeled instead of 2 wheeled vehicles is

In this case the employment of 4 wheeled vehicles does not economise draught power. supposed to afford economy in draught power, but in this case it has been shown that the same number of horses would be required to transport the same number of rounds, whether carried in wagons or in carts ; but that the horses drawing the carts would be less heavily loaded than those drawing the wagons.

The sketches and details of construction, &c., have been taken from

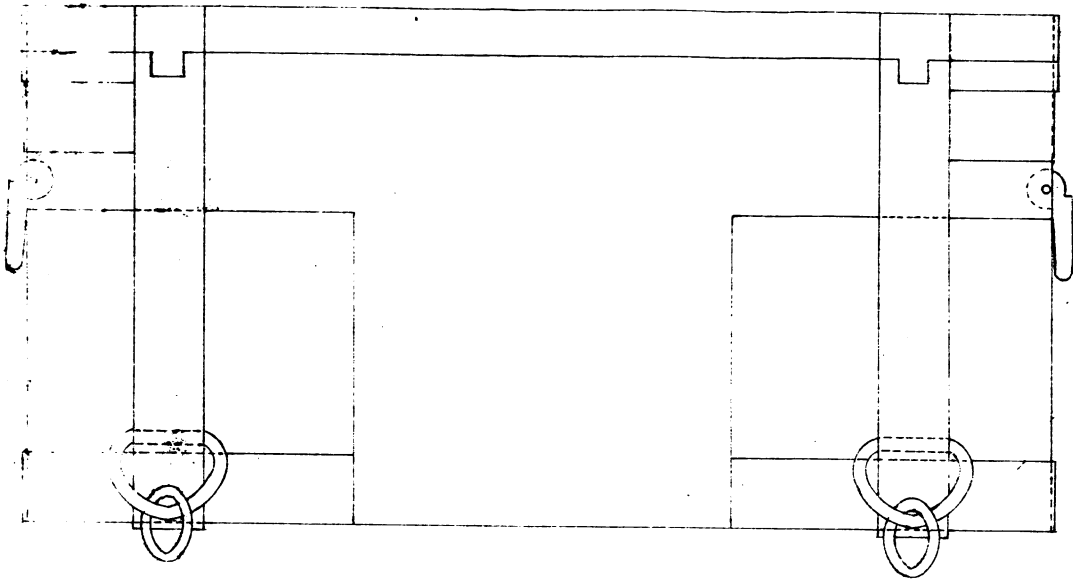
Sources of information. drawings and specifications kindly lent to the writer by Major Mackenzie, Superintendent of the Gun Carriage Factory, Fatehgarh ; though roughly executed it is hoped they will sufficiently illustrate this article.

*Cart Ammunition Field Artillery converted from limber 9 P<sup>r</sup> R.M.L.*

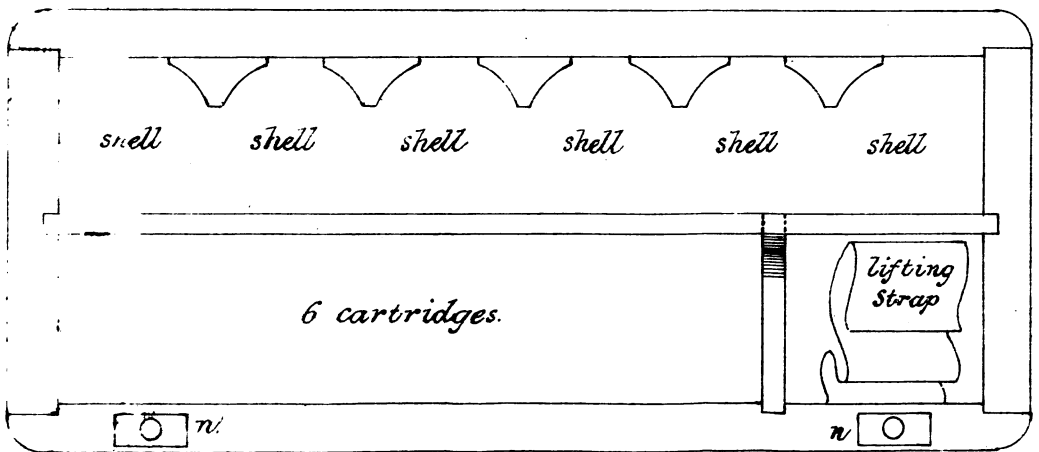




*Box Wood Ammunition Mule R.M.L. Field 9Pr*



*Rear*



*Plan*

*Scale 3 inch = 1 foot.*



## VIII.

### INFANTRY SCOUTS.

BY

LIEUT.-COLONEL O. R. MIDDLETON.

It would seem that the selection of men for Scouts and their special training, is not fully carried out in some Battalions of Infantry in our Service.

The Field Exercise for Infantry does not contain any instructions for such training; it merely, in a foot note at page 212, says that "men selected from the marksmen of a company will be detailed for this duty."

The following suggestions are offered, as to how these men should be used and trained.

1. In every company there should be 8 men detailed as regular Scouts, (two for each Section), and others to take their place in case of their absence from parade.

2. In the attack "the Scouts will, if ordered, move out and remain 100 to 150 yards in front" (see part III. Section 42, Field Exercise). It is presumed that they will be ordered out when advancing to the attack over undulating ground or where there is cover, so as to give timely notice should any of the hollows or covers, be occupied by the enemy.

An example of the use of Scouts in front of an attacking line occurred at the battle of Mars-la-Tour on the 16th August 1870. An attack was ordered to be made on the French right flank, which rested on Ville-Sur-Yvon, about  $1\frac{1}{2}$  mile to the north of Mars-la-Tour. The 61st Prussian Infantry Regiment was detailed for this duty. Each battallion advanced with 2 Companies extended and 2 Companies in support. They passed through Mars-la-Tour; north of that village they encountered a heavy fire of Artillery and Mitrailleuse at about 1,000 yards distant, to which they were unable to reply with their rifles; they continued to advance, when suddenly they came into a deep ravine. On climbing the opposite height, they found a line of French Infantry at about 150 yards off them, which opened a rapid file fire, at the same time bodies of the enemy came from a lateral ravine against their left flank. The Prussians being thus surprised were completely routed, and could not be reformed until they reached Trouville

Their total loss, out of a strength of about 2,500, was 21 officers, 294 men killed, 22 officers, 321 men wounded, and 726 men missing.

Had these Prussian Skirmishers been preceded by Scouts they would not have been thus surprised.

3. It would also seem advisable to have a line of Scouts in front of a line of columns, be they battalion columns, half battalion columns, or double company columns, advancing at deploying intervals with a view to attack, to give notice of the enemy's positions and drive in his vedettes or small advanced parties. When coming within rifle fire of the position about to be attacked, they should take up ground for their respective sections and find the range.

4. When the attack is taking place, they may, on many occasions, be usefully employed in firing obliquely on the position from one of the flanks.

5. If there is an exposed flank, Scouts should be detached in the direction of the enemy, to give due notice of any turning movement.

6. They should be used as connecting files between the fighting line, supports, and main body.

7. On outpost duty, they are to be used with Reconnoitring patrols (vide part VI. S. 3, viii). "These patrols" it says "must be preceded by scouts, quick intelligent men, selected for that duty, whom no sound will escape, and whose experienced ears will detect the approach of danger."

8. It would also seem advisable to use such men in front and on the flank of advanced guards, as well as to connect the various bodies.

9. The men, therefore, selected as Scouts must be marksmen, with good sight and quick ears, athletic and intelligent, in fact the eight best men in the Company, and in order that they may perform these various duties, they must have a special training.

10. As a rule it will be found that the best shots, are the most intelligent soldiers; to shoot well a man must be able to see well, and if he has good quick sight, his other faculties are generally likewise good. It may, however, happen that such a man is not possessed with good physical ability, if so he should not be chosen for a Scout.

11. It will be advisable at first to practice these Scouts in moving by signal, their attention being attracted by the whistle. It will be observed that the signals contained in Part II of the Field Exercise, pages 92-93, differ from those given in Part VI. page 321, in-so-much that the head dress is to be put on the rifle to denote exactly the opposite events; it would seem better to adopt those given in Part II, as they would be less conspicuous when the enemy is in sight. The signal, however, should not be confined to those given in the Field Exercise, but might be extended even to a knowledge of the Morse alphabet.

12. They should be exercised in taking up distances for their sections when extended at a various number of paces and selecting ground where the best cover is to be obtained.

13. They must be exercised in judging distance on every kind of object, more particularly on men firing blank ammunition from shelter trenches and Artillery in action. They should also be able to assist in finding the range with the Range-finder. They should be taught to consult each other as to the distance of the object which is being judged upon, and try shots at different sights with a view of testing the distance. No exertion should be spared to endeavour to find out the range before the fighting line comes up.

14. They should be exercised in firing at all kinds of objects resembling, as near as possible, what would be seen in the field, both moving and stationary, and in all sorts of positions, using, where it can be obtained, an artificial rest.

15. They must be taught how to observe the different indications which denote the approach of Cavalry, Artillery, and Infantry, and to judge as to numbers.

16. They must be particularly instructed in patrolling ; the course

Diagram B.

to be adopted in "approaching" a village, ascending a hill, examining woods, ravines, morasses, etc." (Part VI. F. E). In performing these duties, they should be taught to give one another mutual support. For example, suppose a hill has to be ascended to obtain a view, by a patrol of 1 Non-Commissioned Officer and 6 men; one would be sent round the base of the hill, whilst another crept up; the remaining 4 men should take up a position to cover by their fire the two advanced men in case they should find the enemy on the top of the hill and have to come back.

It should be explained that the enemy would probably fire at those who fired on them, and that the advanced men would thus escape.

17. They should be fully exercised in the gymnasium, especially in the use of the bayonet, and in assisting one another to pass over obstacles.

18. They should be practised in making shelter pits, rifle pits, and loop-holes.

*(Manual Elementary of Field Engineering.)*

19. These men should be trained by the Subalterns of their Companies, under whom they will have to work when in the field.

It would, no doubt, be desirable that every man of the Company should be so trained, and the Field books in use seem to contemplate such, but experience shows that every man in the ranks is not competent to perform these duties, and the result is that, as a rule, the training in them is generally very superficial.





Diagram A.

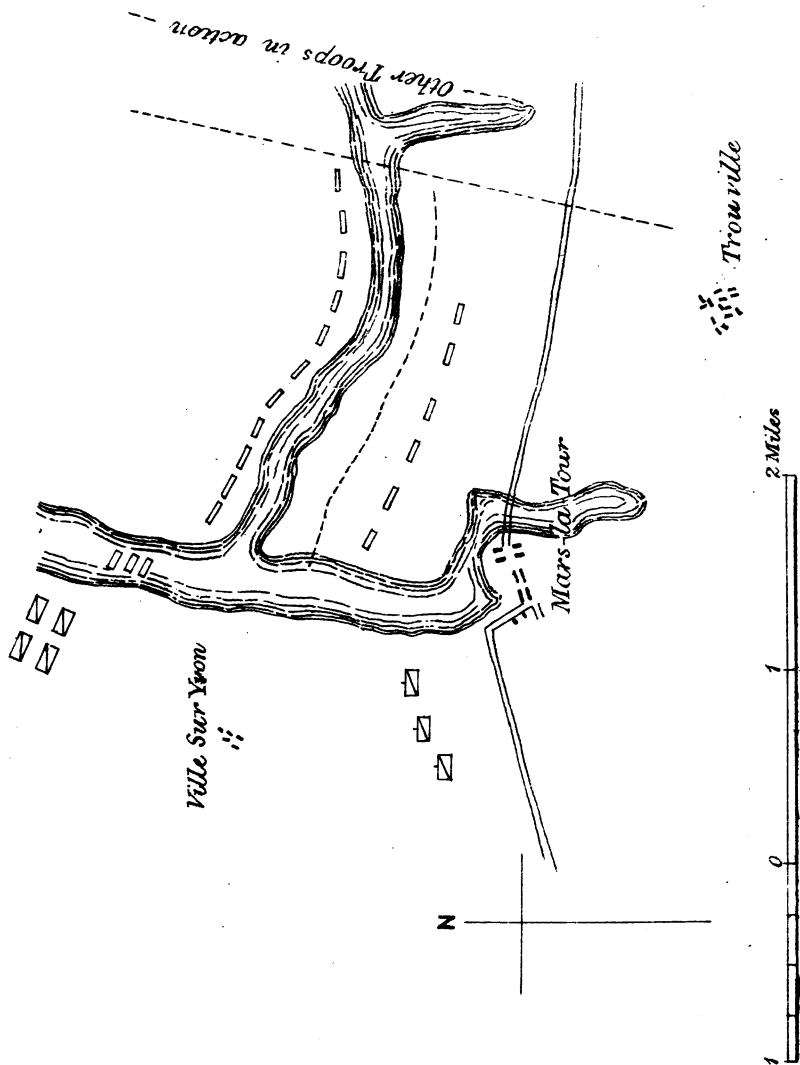
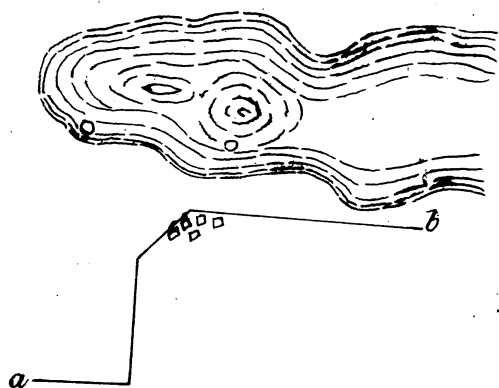




Diagram B.



*a.b. Low Wall.*



## IX.

### CHINESE FORCES AND ESTABLISHMENTS, MILITARY AND NAVAL.\*

*Translated from the August Number of the VOYENNI SBORNIK, a  
Russian Military Magazine, for 1880.*

BY

MAJOR WALTER E. GOWAN.

General character of Military Reforms in China—Land Forces—general construction of Army—organisation of the Superior War Administration—Banner,† or Regular Army—Army of the Green Standard or National Militia—general strength of Army—training—armament—Corps of Officers—equipment and victualling—home distribution—numerical strength of the forces modelled on the European system—Fortress Armament—Military—technical establishments—Fleet.

The present state of the war strength of China is interesting in many particulars. Up to the year 1858—the year of the conclusion of the Treaty of Tian-Tszin—China, in a military sense, appeared to be the most backward of all existing sovereignties. Her Army was in the same stage of development as it occupied during the 17th Century. It was distinguished by an almost entire absence of organisation; it possessed an armament unsatisfactory in the highest degree; it was devoid of everything in common with a military scientific training; in short, the bands which were comprised under the designation of the Chinese Army had no sort of military signification. It is, in fact, well known, that in the year 1842 the Celestial Empire, though reckoning its hundreds of thousands of soldiers, could not display any serious opposition to the detachment of English troops that found its way to Nankin, the Southern Capital of the Empire. In 1857 Canton was taken, and in 1860 Peking was occupied by French and English troops. But without making mention of European forces, the Chinese Army, of the period of which we are speaking, could not even successfully contend with antagonists whose military preparedness was altogether infinitesimal. From 1850 to 1860 the Taipings, insurgents who had risen against the Chinese Government, held the whole country in a state of terror, boldly and triumphantly advanced throughout the length and breadth of China, beginning with the southern provinces and ending on the borders of Peking, and were at last subdued, not by the armies of the Chinese Empire, the descendants of those Manchjoors who had at some time or other conquered China, but by a “foreign legion,” led by an English Officer of Engineers, the “Chinese Gordon.” All these events, however, brought home to the Chinese Government,

\* On Pages 358-377, Vol. XXIV, Journal of R. U. S. I. for 1880, will be found a Paper entitled “the Chinese Army” by Captain William Gill, R. E.

† I have used the word “Banner” in place of “Standard” in order to avoid the possible confusion between the words “Standard” and “Standing” or “Regular Army.” Trans.

how its Army existed only on paper, and induced it to carry out some sort of improvements in its military system. The first step to this end was taken immediately after the conclusion of the Tian-Tszin treaty, and the "foreign legion," above alluded to, formed the nucleus of the new Army. Consequent on the subjugation of the Taipings, all military reforms received a wider scope. But in the reorganising measures of the Chinese Government we shall seek in vain for that which is usually beheld in Europe. We shall not find one general plan, one worked out system, which is to take the place in its entirety of that which has been found to be unsatisfactory. Nothing of this kind will strike the eye. The Chinese Government confined itself to the hiring of foreign instructors; it bought a given quantity of arms of European make; embodied some sort of Artillery; constructed arsenals, powder and small arms factories, &c., but adhered to its former army organisation, retained its ancient administration, and left untouched its old and antiquated military system. And so the military reforms of China are destitute of any wide signification, and leave, as we shall see below, the modern army of the Celestial Empire but little altered from that of the year 1842.

Before entering upon our present sketch, we would observe that all information regarding the military resources of China is very meagre. The article here presented to the reader has been compiled, partly from information that has appeared at various times in the "Voyenni Sbornik," and partly from details communicated of late in various foreign publications devoted to questions of military interest.\*

General construction of the Chinese Army. The Manchjoor armies

Land forces.

that conquered China in the beginning of the 17th Century, were at first divided into four main bodies, distinguished from each other by the colour of their standards. These were yellow, white, red, and sky-blue. Later on, four more detachments were embodied and these also received standards of the existing colours, save that they had a red fringe (the edging of the red standard was sky-blue). The Manchjoorian levies† now comprised eight standards and numbered some 60,000 men. Besides these bodies there were Mongol and Chinese bands that were subsequently also placed under standards to the number of eight of each race, the strength of the first being 24,050 and of the second 16,840 men. These 24 standards now comprise, what may be called, the Chinese Standing Army.‡

The so called army of the Green Standard,§ which is a kind of militia, serves as the Army of the second line.

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\* The writer of this paper has obviously had access to, and has used the report on, the Chinese and Japanese forces, by General Upton of the United States Army, yet that distinguished officer's name is but once casually mentioned, whilst his information, freely used, has not been acknowledged. Such plagiarism is not, however, confined to Russian writers. Trans.

† "Pah-ki."

‡ "Hain-ki-Ying."

§ "Luh-Ying."

Before proceeding to a closer examination of the two forces above mentioned, let us say a few words regarding the organisation of the Superior War Administration of China. We shall thereby be in a better position to understand the reasons for the unsatisfactory condition of the armed strength of the country. By law, the general administration of the Army and of the Navy lies in the hands of the Chinese Minister of War.\* But as a matter of fact he has only direct control of the Imperial Guard and of a very small portion of the forces of the Green Standard stationed at Peking, whilst those portions of the army distributed through the provinces are in no way under him for any practical purpose. Furthermore, the War Minister merely superintends the organisation of the forces, whilst their payment and supplies come before the Financial Department, their equipment and armament being regulated by a special committee. Thus it is that the War Minister has to work with, and superintend, several administrative departments with a very diverse system of action. Finally all the military technical *bureaux* are under the minister of Public Works. The forces distributed over each province are commanded by a general officer who is in turn subordinate in every particular to the Governor General or Governor or highest civil functionary of the particular province. The discipline of the army is upheld by a system of inspection. These inspections are carried out thrice every year. The Governors have to report to the War Minister the results of their observations, on these occasions. Thus then, the greater proportion of the Chinese forces is administered by the local Governors. And yet, though the training, armament, and even the numerical strength of the forces altogether depend on the supervision of the superior local and civil functionaries, they nevertheless cannot be held completely responsible for the bad condition of the troops under them, nor for their inferior discipline, nor for the disorder which reigns on all sides. For certain it is that there are amongst the Governors individuals who, through their intimate relations with foreign officers, thoroughly appreciate the importance of a modern military organisation and the more recent systems of armament; and yet the Central Government obstinately opposes the efforts of such men in any of their comprehensive efforts at re-organisation. Still, however, there are some such officials who, as we shall see further on, persevere, within the limits of their own rule, in their endeavours to improve the training and the armament of the forces entrusted to them. It must, on the other hand, be observed that the wide extent supervised by each local governor, and the absence of all administrative force on the part of a Central body, have led to the complete overthrow of uniformity in the Chinese Army. There are no two provinces wherein the armament and equipment of the troops are alike, and so, according to the individual supervision of each governor, the provincial forces either progress or remain in their primitive condition.

Let us now occupy our attention with the Regular Army.

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\* "Ping-Pu."



The 24 standards detailed at the beginning of these remarks may be regarded as the embodiment of eight standards of maximum strength, since the number and colour of the standards of each of the three nationalities comprising the Manchjoorian Army are identical. By applying the designations of European military terminology which most readily pertain to the units of the Chinese forces, it may be said that the above eight standards of maximum strength are divisible into eight Army Corps of three divisions each, formed of Manchjoor, Mongol and Chinese elements respectively. Since the conquest of China, the greater proportion of the Banner Army has been concentrated in Peking and the neighbourhood, whilst the other military bodies have occupied the principal strategical points of the Empire. The Manchjoor forces have still preserved their ancient system of organisation and their privileges as conquerors of the country. Since their advent, they have formed themselves into a military class from which they have enrolled a contingent of conscripts which forms the nucleus of the Army. Every individual, who at birth enters this military body, is entered on the roll of a particular standard, and this act, so to speak, constitutes his hereditary birthright. As regards the Banner troops of the Peking garrison, the classification of the standards by divisions partakes of a purely race distinction and in no way represents that tactical division which is implied by the designation "division" as known in European Armies. An administrative character is given to the further subdivisions of the troops into regiments, of which, in each of the Manchjoor and Chinese divisions, there are five, and in the Mongol divisions two. The final unit of the sub-division of the standards is the company. The number of these is not fixed and entirely depends on the numerical strength of the Standards, with this sole proviso, that in one and the same company there shall not be more than 300 heads of families. Anything over this number entails the formation of a new company. In former times each company had an actual strength of 300 men, subsequently this fell to 150 and now it is only 90. The number of companies in the troops forming the garrison of Peking is as follows:—

| Army Corps.      | Manchjoor. | Mongol.    | Chinese.   |
|------------------|------------|------------|------------|
| 1st              | 86         | 28         | 40         |
| 2nd              | 92         | 24         | 40         |
| 3rd              | 86         | 29         | 40         |
| 4th              | 74         | 22         | 28         |
| 5th              | 84         | 31         | 30         |
| 6th              | 86         | 32         | 29         |
| 7th              | 84         | 30         | 30         |
| 8th              | 86         | 25         | 29         |
| <b>TOTAL ...</b> | <b>678</b> | <b>221</b> | <b>266</b> |

or 1,165 companies in all. Now, supposing that the average strength

per company is 90 men, this would place the figures of the Pekin garrison at 105,000 approximately, a number which is very similar to that of the original strength of the Manchjoorian Army. The provincial garrisons are not reducible into divisions or regiments but each forms a separate unit divisible into companies only. It is generally supposed that in the provinces there are distributed 840 companies of Banner troops with a total strength of 200,000 men. In a tactical respect the forces of the Pekin Garrison comprise the following:—1/ Cavalry Corps, or the so called "detachment of brave Cavaliers,"\* the strength of which, inclusive of non-combatants, may be put down at 37,000 men: 2/ the advanced guard† which is made up of two men from each Manchjoor and Mongol company, and the "detachment of Assailants"‡ numbering 2,000 or 3,800 men in all: 3/ the Imperial guard, which is composed of two men from every Manchjoor and Mongol company, total 1,800 men: 4/ the Old Guard of 19,000 men: 5/ the Horse *Chasseurs* (Manchjoors and Mongols) numbering 5,300 men: 6/ the Imperial Hunt retinue, composed of 600 men: 7/ the field artillery numbering 1,100 men: 8/ the fortress artillery, who serve the guns on the Pekin ramparts, and number 900 men: § 9/ the infantry corps, who in time of peace perform the police duties of Pekin and number 45,000 men, including 10,000 irregulars. The fighting unit is the "lianza" which in the infantry is represented by 500 men, and in the cavalry by 250. The infantry "lianza" is, therefore, a battalion of five companies. Sometimes several "lianzas" are embodied in one command. Each company|| is made up of two half-companies; each half company of sections of ten men in each.

From what has been said above, it is apparent that the organisation of the Banner forces is purely territorial and that these forces may be compared with former Austrian border levies, or with the Swedish local bodies of troops, except that the Chinese Banner Army is not scattered over settlements but concentrated in various towns.

It should be observed, however, that prior to the accession to the throne of China of the Manchjoor dynasty, to all the troops were assigned lands which were at that time amply sufficient for the support of themselves and their families. But later on, partly in consequence of the augmentation of the military class, partly by reason of the impoverishment into which the greater number of the soldiers fell, these lands either got into the hands of a few or became the property of private individuals, and the troops then had to depend solely on their money allowances from the State. Hence, whenever the lower ranks were not called upon for active service, they were allowed to undertake any kind of work within the limits of their own native place. The Banner troops stationed in Pekin and the

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\* "Chwang-Yung."

† "Tsien-Fung."

‡ "Hu-Kiun-Ying."

§ "Pu-Kiun-Ying."

|| Above, the writer of this article has stated that the final unit is the *company*.  
Trans.

neighbourhood are called "Tszin-lu." The remainder are styled "Chu-Fang." The time was when these Banner troops were distinguished for a genuine military spirit, but with the lapse of time, and in consequence of their lengthened stay in one and the same garrison, this spirit has almost entirely disappeared, so that the Chinese soldiers of to-day possess in a very inferior degree the qualities of their ancestors. In the receipt of scanty pay they are compelled to have recourse to every possible occupation so as to just maintain themselves and their families. The Government is aware of the fact, and, therefore, on rare occasions only calls them out for military manœuvres.

Each of the 18 Chinese provinces is obliged to maintain a certain number of militia men, enrolled exclusively from the purely Chinese portion of the inhabitants of the country. The strength of this body is, according to the returns furnished, 651,677 men. It is under the direct orders of the Governors of provinces, and although in every province there is a special officer in command of the troops of the Green Banner, his staff is but a branch of the Civil Governor's Administration. According to the latest information, there enter into the composition of the national militia 80 generals and 7,077 staff and under-officers, so that for every 90 men of the lower ranks there is but one officer. It should be observed, however, that the actual strength of the Chinese forces never comes up to the figures on paper, though it may be admitted that, as regards the officers, this is the case, and that between this grade and the lower ranks of the Chinese National Militia the same relations exist as in European Armies. Nevertheless, in the face of present conditions, the fighting signification of the Army of the Green Standard may be regarded as very doubtful. It is thoroughly untrained, and its *personnel* depends on the requirements of the moment. In the Chinese army there is neither *camaraderie* nor military zeal. Whenever a popular outbreak, or any like cause, calls for the placing of forces in the field, the provincial authorities hasten to fill the ranks by forcibly enrolling peasants and all peaceful citizens who come to hand. Such improvised contingents are always ready to take to flight on the first favourable opportunity, as was the case during the quarrel which arose between China and Japan in the year 1874. From the ranks of such portions of the National Militia as were ordered to the island of Formosa, the men deserted in masses, and those who were cajoled into embarking cast themselves in large bodies into the sea, as soon as they became aware of their real destination.

In case of any extraordinary need and of the impossibility of getting persons liable to service, recourse is had to the casting of lots and frequently to a system of press-gangs.

\* Captain Gill, at page 363 of the Paper quoted at foot of page 1 of this translation, says "this force is composed entirely of Chinese and is often, by foreign writers, inappropriately styled militia. It is, in fact, the Constitutional Army of China—the Banner-men being the soldiers of an alien though Suzerain Power." Trans.

It follows then that an exact determination of the numerical strength of the Chinese forces is quite impossible, but it may be said to vary from 500,000 to 1,000,000, according to circumstances and the will of the Governors of the several provinces.

With regard to the training of her forces, China has not had much success. In the great maritime towns, a portion of her army has received training from time to time at the hands of European instructors,\* and the knowledge so obtained has been conveyed, in some slight degree, to the forces in the interior of the country. But even now, Chinese officers have not the faintest notion of what troops should know who are supposed to fulfil the requirements of modern warfare, nor of the disposition or handling of forces in battle. Regarding the parade formation of the Chinese Army, Colonel Sosnovski,† who had opportunities of personally observing that Army, thus writes.—“The Chinese troops move in a long thin line which is speedily deepened by two or even three ranks that work either separately or together. The Chinaman has apparently endeavoured, not to simplify, but to complicate the playful formations of a *corps de ballet*.”

“He would seem to amuse himself in making a line first snake-like, then compact, again loose, once more shortened, and again extended, each rank keeping its place during such movements. The primitive troops have no measured step, but those taught on the European model keep some sort of time. The latter, too, are distinguishable from the former by their armament. The whole are furnished with the same standard and flags. For the Tian-Tsin troops, Li-Tsun-Tang has adopted our discarded battle formation, whilst the troops quartered at Fan Chen are trained on the English system.” The same writer says further on:—“The higher officials take no part in the parades. The training is carried on by a professional instructor who, in place of a weapon of any kind, carries a switch with which he beats any one who goes wrong. The under-officers are similarly equipped. It is said that in battle the same symbol of command is carried by these ranks.”

On stated occasions, days are set apart for the holding of manœuvres. Tents or pavilions are erected and tables spread, laden with viands and cooling drinks. The guests are invited to take their seats and the spectacle begins. Regarding, as he does, military exercises in the light of a diversion, the Chinaman may still be said to give his most serious attention to the development of this kind of jugglery. Aiming drill, with blank cartridge, takes the place of target practice—“otherwise,” as the Chinese informed Colonel Sosnovski, “the men might manage to get killed.” These remarks do not apply to troops equipped on the European model who, according to the testimony of Colonel Sosnovski, shoot with fair accuracy. The Artillery evolutions are carried out in

\* And it may be added of American. Trans.

† An account of Colonel Sosnovski's expedition to China in 1874-75, was abridged and tabulated from the Russian by Captain F. C. H. Clarke, R. A., for the Royal Geographical Society, London, 1878, but unfortunately it contains nothing about the Chinese Army. W. E. G.

the same irrational way as those of the infantry, and they too use blank in place of ball ammunition. The Cavalry formation has nothing in common with that system of training which is at present engaging the attention of troops of this branch of the service in European Armies.

The Armament of the mass of the Chinese troops is of a primitive description, and consists of flint matchlocks and falconets, cross bows, spears, lances, &c., swords, cutlasses, halberds, short knives, axes and iron rods. The following is the order and description of the armed ranks.—In the first rank are the standard bearers. In the second, the first man carries a spear, the second a musket or some sort of short weapon of cold steel, the third a spear, the fourth is in charge of a falconet which is borne on the shoulders of two or three men by his side, &c. Where there is a third rank, that rank carries the same description of armament as the second rank. For the carrying out of orders there are drums, kettle-drums and bugles. When starting on a campaign, the troops are furnished with *Chevaux de frise*, scaling ladders, camp vessels and tents, &c. Modern weapons are found only amongst the troops stationed in the maritime provinces in the western portions of the Empire. In the army of Li-Tsun-Tang, the Governor of Chjili, will be seen rifles on all the newest systems. In that of Tszo-Tsun-Tang, the Governor of Han-Su and Shan-Si, there are, as a rule, two kinds. In the Infantry Remington rifles and a small number of percussion smooth-bores. In the Cavalry, the Spencer Carbine. The older ordnance consists of short cast-iron guns of a purely Chinese pattern, eight six-pounder rifled guns presented by the Russian Government, and some brass guns cast by the Jesuits in the time of the Emperor Kap Chi. The modern ordnance comprises guns prepared in the Chinese arsenals, of which mention will be made further on, and those received from abroad. The German foundry of Krupp has furnished China with 150 siege guns of the following calibres:—73 cannon 12-centimètre,\* 66 of 15-centimètre, 7 of 17-centimètre, and 4 of 21-centimètre. The number of field guns that Krupp has turned out for China is 275, viz., 6 of 4-centimètre calibre 11 of 6, 1 of 7, 248 of 8, and 9 of 9-centimètres. Regarding the number of guns prepared in the Chinese foundries there are no approximate particulars, but it cannot be thought to be considerable.†

The Chinese corps of officers is in the most unsatisfactory state. This is partly explained by the existing system of promotion, and partly by the want of respect shewn to the Military profession, as a whole, in China. According to Chinese notions the pen alone will bring to a man

\* 1 Centimètre = 0.374 inch. Trans.

† Mr. Demetrius Boulger says, vide page 375, Vol. XXIV of Journal, R. U. S. I. for 1880.—“It is very important to call attention to the manufacture of weapons at the Kiang-Nan arsenal. It is not generally known that, at that arsenal last year, (1879) they produced twenty 40-pounder Armstrong guns, which were tested by European engineers, who said they were as good as if they had been turned out at Elswick or Woolwich. They have also turned out 7 inch 150-pounders which have stood the same test, and my information states that those guns, made on the pattern of Armstrong's have been sent on active service.” Trans.

a great name. In the Army of the Eight Standards, the rank of officer, with the exception of those of the first four classes, is hereditary, whilst into the Army of the Green Standard, Officers cannot enter until they have concluded a course of military science. This course, like that in the Civil Service, is divided into lower, middle, and upper. The last is finished at the capital by an examination in presence of the Emperor.

Since the date of the throwing open of the Civil Service of China to the educated classes only, the appointment of Officers has been made irrespective of the degree of proficiency on the part of each candidate. In this respect, in China have been preserved those traditions that preceded the introduction of fire-arms. Officers have been regarded in the light of trained athletes needing only the development of physical strength to fit them for the exercise of the duties of their profession. So completely is this idea embedded in the intellect of official personages and of those serving in the army, that the sole qualifications for the grade of officer are held to be expertness in archery on foot and on horse-back, sword practice and the strength to lift and to throw heavy weights. The American General Upton relates in his book, "The Armies of Europe and Asia," what he saw at Peking in 1874.—"135 officers, who had graduated in the examination at the Capital, were subjected to a further test. Each graduate was required to exhibit his skill in horse and foot archery, sword-practice, and a peculiar exercise, called "ta-chi." This consists in throwing a square stone weighing about 56 English pounds. The stone is thrown and has to be caught in a net which is held out. The recipient then shies it on to his neighbour who has to take care that it does not fall to the ground. Eleven of the candidates who entered for these tests were, after prolonged trial, declared failures, and were debarred from appearing at the examination in presence of the Emperor. Moreover the officials who had permitted them to appear at the capital were punished. Of the candidates who were allowed to try their skill before the Emperor only four were promoted to the rank of officer. Seven individuals who were declared to have failed in one only of the three exercises were directed to try again after the lapse of three years. And one who was judged to have fallen short of the standard in both the sword-practice and the stone-throwing was ordered not to again appear until six years had passed by. The personages before whom the preliminary trials had taken place were also punished. From what has been said it will be seen that the promotion of military candidates in China is hedged in with all possible precautions to guard against deceit and that the Emperor himself takes an active part at such examinations." In the work above quoted, General Upton tells us of a competition in Archery held at Canton in 1875, in the presence of the Governor-General. Targets 6 ft. x 2 ft were placed at a distance of 60 yards. Each candidate was permitted to shoot six arrows, and at the beginning and end of his trial saluted the Governor-General by kneeling. The number of hits was marked every time by sticks which were placed in front of the Governor-General. Some of the candidates missed every shot, whilst others, who were more successful, were allowed to enter for the other

events. Those who passed all the tests were commissioned as Lieutenants in the army.

The system of competitive examinations for officers of the army was introduced by the present dynasty in imitation of the time-honoured custom for the filling up of appointments in the Civil Service. The tests imposed clearly indicate in what little respect the Military Service is held in China. Reversing the practice of Europe, where a higher scientific and more general education is required to insure entrance into the Military as compared with the Civil Service, the Chinese Government simply demands of the aspirant for a Commission, evidence of physical skill and brute force, whereas the candidate for Civil duties, after devoting the best years of his life to study, must evince a complete knowledge of the national literature and classics. To dilate on the merits of officers educated on such a system would be useless. As the study of the art of war, of tactics, of gunnery, of fortification, or of any of the sciences so closely bound up with modern war problems, are so completely ignored, the Chinese Officer is perforce sunk in ignorance as deep as that of his men, and frequently shows as little respect for Military Regulations and Ordinances. Since he does not rise above the common soldier in respect of *morale*, the officer displays the same gross ignorance of the service generally. He is not, therefore, in a position to give any sort of satisfactory answer out of the sphere of his own special work. He cannot state with accuracy the calibre of any particular gun, or what is the weight of the charge which it carries. This ignorance, and enforced concomitant idleness, and the development of every kind of vice throughout the Chinese Army, particularly the use of opium, destroys the health of all ranks, rendering them unfit to undergo the fatigues and hardships of a campaign. The Military grades of China are divided into nine classes. Promotion to the higher ranks depends on vacancies and individual merit. That to the first four grades is in the hands of the Emperor himself. Rewards take the form of robes of honour, the bestowal of the right to wear a pea-cock's feather in the hat, and the conferring of the titles "Highness" and "Distinguished." The pay of an Officer is comparatively speaking liberal. For example, a battalion commander receives 250 *lans* or 500 *roubles* (£62-10) *per mensem*. It must be observed, however, that this sum includes all personal allowances, and is subject to all charges under the head of Office Establishment and writers' allowances.

The uniform of the lower ranks of Chinese soldiers is as follows:—

|                                      |                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------|
| Equipment, payment, and victualling. | Upper Coat of a coloured woollen material with a narrow braid of the same colour. |
|--------------------------------------|-----------------------------------------------------------------------------------|

Trowsers of cotton material or of plush. Over these is a variegated skirt-like garment studded with buttons. The head dress consists of a cloth bound round the head in the shape of a turban. The foot-coverings are either of plush or leather or are ordinary bast or grass shoes. The designation and appointments of a particular "lianza" are denoted by badges embroidered on the breast or back of the wearer. Officers have balls on their caps according to rank. In the Banner Army there are certain money allowances and rations of rice which are

issued under the orders of the Financial Bureau. The victualling, &c., of the enrolled forces is not in all places the same, although the local officials strive to make it uniform by establishing an average figure for the lower ranks as follows:—for the infantry about three *lans*, and for the cavalry about nine *lans*, *per mensem*. In former days the enrolled troops received no uniform. The issue of this was instituted only seven years ago. In the Army of the Eight Standards the equipment is either carried out by the issue of arms or by a fixed payment for the purchase of such. To the troops of the Green Standard arms are always issued. The “Control Bureau” is charged with the issue of the arms, equipment and victualling, &c., of the troops. It need scarcely be observed that the occasions on which the army receives a full allowance are rare, since the custom is strictly upheld amongst the Chinese Military Officials of setting apart, for their own use, a certain proportion of the allowances of the soldier.

But little is known of the home distribution of the Chinese Forces, the more so as this entirely lies with the local officials. The troops quartered in the towns occupy detached buildings, which in geographical descriptions are known under the name of “Tatar” huts. The non-standard troops generally occupy separate camps or barracks. Each “*lianza*” has its own camp or block, the type of which is the same in all localities, *viz.*, a large open space surrounded by a wall, on the inside of which are, say, 147 detached huts. The line of huts in rear are occupied by the officers, those in front by the rank and file. The soldiers sleep on stove-couches, which in winter time are warmed up. The food is prepared on a peculiarly constructed hearth to be found in every hut, since every soldier looks after himself. According to the testimony of persons who have had opportunities of visiting Chinese camps, the quarters of the troops are clean and well-kept, but in consequence of the confined space allotted, the atmosphere is stuffy and charged with tobacco smoke, and the odour of cooking—facts which scarcely fulfil the requirements of sanitation. In the centre of each camp a string is hung up displaying the rank and surname of the Commander. All soldiers of inferior rank are required to pass the night in camp. Should they wish for leave to sleep elsewhere, they must seek it from the nearest superior officer. The Chinese soldiers usually eat thrice daily, *viz.*, early morning, mid-day and evening. Although they can, if they please, eat apart, they usually do so in groups of ten men, one of whom acts as cook. For offences, the Chinese soldier is subjected to disciplinary punishments that take the form of blows with a bamboo, placing hands or feet in fetters, or the head in the stocks, &c. &c. For capital offences the Chinese soldier is tried before an ordinary Civil Tribunal.

From the particulars above put forward regarding the Chinese Army, it can be seen how far the ancient military system falls short of modern requirements, and how little it is capable of re-organisation. This fact is recognised in China itself, where there are individuals who desire to tear up connection with the past and to inaugurate a thoroughly new system. In the face of an ultra-decentralisation for



the army, the efforts of certain persons to that end have led to that obliteration of every trace of uniformity which is apparent at the present time. In fact, one cannot speak so correctly of a Chinese Army as of various provincial forces, each of which forms a separate army. A Chinese army, in a wide sense, does not exist, but there are the armies of Li-Han-Chjan, Li-Tsun-Tan, Tszo-Tsun-Tan, &c. Dependence on a given personage is, in practice, very strictly observed, and not unfrequently troops quartered within the jurisdiction of one Governor General have put themselves under another because they were organised and supported by him. To the Central Government is subordinate the Guard Army Corps only, which is kept up for the sole purpose of guarding the residence of the "Son of Heaven." This Corps, during the middle of the past century, was made up from the ranks of the Banner Army, and with its training and armament the Government took special care. The strength of the infantry portion was about 11,000 men, who were drilled by foreign instructors and armed with modern rifles on various systems. The Cavalry portion of the same body, numbering some 6,000 men, were armed with rifles and carbines on the Chassepot pattern. The Artillery of the Guard, about 2,000 strong, have 32 guns, eight of which are 6-pounders, that were presented by the Russian Government, and some mortars. Amongst the forces distributed over the provinces, conspicuous are the armies of Li-Han-Chjan, Governor of Chjili, and of Tszo-Tszun-Tan, Governor of Han Su and Shen-zi and the ruler of the provinces bordering on Russian territory. Li's army is reckoned at 70,000 men. Its organisation follows that of European armies, and most of the men belonging to it have received training at the hands of Europeans, whilst their rifles are on the newest system and their practice therewith fairly good. The greater proportion of the ordnance furnished by Krupp to China is with Li's army. But since the Chinese Artillery has no regular organisation and is not horsed, the tactical qualities of this branch of Li's army are extremely unsatisfactory. The Governor General of the Chjili Province has, however, shewn himself to be in favour of the widest reforms in the military line and has laboured to raise his troops to the level of the modern requirements of the Art of War, and he has sought to introduce into China the rules of European military science. It was at Li's solicitation that certain Chinese officers were sent to Europe, to Shpandau, for example, with the object of becoming acquainted with the military economy of European States. Tszo-Tszun Tan's army possesses the same military qualities. In 1868, when Tszo-Tszun-Tan was appointed Governor General of Shan Han, wherein a violent insurrection was going on, the forces of the Chinese Government in that province were in a desperate condition. The evil practices of the leaders had become so great that whole battalions went over to the insurgents. The new Governor General energetically set himself to the task of re-organisation; the *personnel* of the Intendence was changed, soldiers were enrolled; the several branches of the service overhauled; a foundry set up at Tan-Chjee-Foo; steel breech-loaders on the newest system were turned out, and soon successful operations against

the rebels displayed the fighting capacity of the remodelled forces. In 1874, Tszo-Tszun-Tan's army was augmented by 30,000 men from the forces of the province of Chjili, and then there were collected in the province of Shan-Han 150,000 men, but the war quality of this body was very varied. For want of money many soldiers were subsequently discharged, and latterly Tszo-Tzun-Tan had at his disposal not more than 40,000 trained to a certain extent in the European style and provided with modern arms of precision. With regard to the troops distributed over the southern provinces of China, we have not even approximate information, but there is reason to suppose their number is not otherwise than considerable, since therein lie the centres of European instruction, *viz*: Nankin, Shanghai, Foo-Chjei, Foo and Canton.

The fortress armament of the Chinese Empire is in a very grievous condition. All the towns of the centre of the country are fenced round with brick walls which could only withstand the attacks of a very badly armed enemy. The so-called Great Wall of China, which stretches over 1,200 English miles, is the type of such antiquated defences. The thickness of this wall is from 20 to 23 feet and its height is about 24 feet. Nothing remains to be said of the thorough uselessness of a defensive line which could not even withstand the inroads of the Mongols into China. The walls encircling the larger towns of the Empire are somewhat more solid. The defences of Pekin, for example, are from 40 to 70 feet thick and on an average 40 feet high. Nine gates lead into the city, and these are defended by flanking towers with casemates prepared for guns. Round this wall there is a ditch. Besides her defences of a thousand years old, China possesses several new forts built on the model of the most recent fortifications of Europe. These forts bar the approach from the sea to the principal towns of the Empire. To Canton there are two navigable branches of the Si-Kiang. The eastern branch was at one time defended by batteries that were overthrown by the Anglo-Franco Army, and these have probably not been re-erected. The western branch, however, is commanded by batteries constructed on its banks, and these batteries have Krupp ordnance mounted on them. Encircling the town, besides the customary stone wall, there are several detached forts. The town of Foo-Chjei and the naval arsenal which lies not far from it on the banks of the river, are defended by one battery only. Shanghai, on the sea side, is likewise badly defended. The approach to Pekin from the sea is, however, protected with great care. Here, at the mouth of the river, Pei-Ho Daku fort stands out, a strong position naturally and made more so by skilful armament. On both sides of the mouth of the Pei-Ho stretch morasses and small lakes. The Channel is obstructed by a shoal which at low tide has not more than two feet of water over it. The defences here consist of two forts that strongly command the sea face. The fort on the high bank of the river, with a sea front, had, up to a recent date, 47 guns, and amongst them, several Krupp guns of large calibre. The other fort, erected on the left bank of the river, is armed with 10 guns and it is so placed

as to both flank the southern fort and to command the sea and the surrounding country. Up to within a recent date, the forts were built of mud, the embrasures of which, in place of being sunk, were roofed over with beams, &c., so that one successful shot would completely destroy the opening. It has since been reported that by Li-Hun-Chjan's order these forts have been rebuilt.

The re-organising activity of the Central Chinese Government, as regards the Army, is most of all apparent in the reconstruction of the several military technical establishments.

Up to the period of these reforms, China possessed but one arsenal, that at Canton. Now she has at her disposal 8 factories and arsenals, as follows:—At Tian-Tszin, there is a large powder-factory and Artillery arsenal. At Shanghai, there is a Marine arsenal. At Nankin, an Artillery arsenal; at Canton, a rifle factory; at Foo-Chjei-Foo, a gun foundry and Artillery laboratory; and at Lan-Chjei-Foo, an Artillery arsenal. The Tian-Tszin powder factory stands on the banks of a canal leading from the river Pei-Ho, and consists of a row of new brick buildings which contain separate workshops with good machinery ordered out from England. The factory turns out more than 90 *puds* (3240lbs.) powder *per diem*. The Tian-Tszin arsenal, which was first of all set up in a building ill adapted for the purpose, has now been thoroughly reconstructed on a plan prepared by an English engineer. From information received in 1875 we learn that in this arsenal are prepared cartridges for the Remington rifle, powder, and also charges for ordnance of all calibres. At this arsenal, too, is expected the best English machinery for the manufacture of Remington rifles. The Shanghai Marine arsenal comprises a rifle factory and a gun foundry. Here too, Remington rifles are manufactured. The power used in this arsenal is steam, and the work therein is supervised by foreign mechanics. The Tszian-Nan arsenal, at Nankin, has a large rifle factory in charge of Englishmen. At Canton they turn out Remington and Spencer rifles. The foundry at Foo-Chej-Foo is in the Marine arsenal. Attached to the artillery laboratory of this establishment is a factory for the preparation of Submarine mines. The Lan-Chej-Foo arsenal is taken up with the armaments for Tszo-Tszun-Tan's Army exclusively. It was built by a Frenchman named Dargobé but now its *personnel*, from the Superintendent downwards, is formed of Chinese. In an architectural sense the structure may be described as imposing, but is it ill-adapted for the purpose for which it is used. It contains 200 workmen. All the material used, except the steel which comes from Canton, is obtained on the spot. Good coal is worked in the neighbourhood. According to the data of 1875, there were here turned out 20 4-inch steel breech-loading guns and ten small mountain guns, besides a quantity of breech-loading small-arms. Notwithstanding the imperfection of the machinery here used, the turn-out of this arsenal is satisfactory.

In the Chinese Naval, as in the Military, Department, there reigns complete decentralisation, so that the war ships are under the orders, not of a Fleet.

Central Government, but of the Governors of the Maritime provinces. The necessity of possessing a war fleet constructed on the latest model, was brought home to China after the war of 1857-1860 with the Anglo-Franco forces. The first attempts at establishing one were, however, unsuccessful, so that the actual existence of a Chinese fleet dates from the year 1869. At this time there were inaugurated at Shanghai and Foo-Chej-Foo two Admiralty Boards, and in this year there were launched from the dockyards the first Chinese war-vessels. The dock-yard at Foo-Chej-Foo covers a vast extent, measuring not less than 27 *desyatinas*.\* In the arsenal attached to it there are from 1,500 to 2,000 day labourers. The Shanghai dockyard, which comprises a rifle and gun factory, gives daily employment to 1,200 men. Attached to the Foo-Chej-Foo dockyard are two Marine Seminaries, one, in which ship-building is taught, is in charge of Frenchmen, the other for Naval education and the nautical science generally, is supervised by Englishmen. The Chinese fleet may be classified as follows:—1/ Shanghai squadron consisting of 11 vessels comprising two frigates (one of 2,700 tons), nine transports and gun-boats, of which one is an iron-clad. 2/ The Futszian squadron of 15 vessels, *viz*: a 13-gun corvette, six gun-boats and eight armed transports. This squadron is the best in every way, because it not only contains vessels of excellent construction, but it is well found. 3/ Canton squadron of 12 vessels, *viz*: 7 new English-built gun-boats, two old gun-boats, and three Chinese steam junks. Thus China has a war fleet of 38 vessels of all kinds. It must be mentioned, however, that the Chinese Government has lately ordered from England several gun boats of a special construction. These will permit of a serious part being taken in naval engagements, since, though these vessels are small, they are armed with one 35-ton gun, *i.e.*, with a description of ordnance only to be found in the largest English iron-clads. The vessels in question are to be built and equipped by Sir W. Armstrong, who likewise furnishes the Artillery with which they are to be armed. Eight of these gun-boats, called after the first letters of the Greek Alphabet, have been sent to the Chinese port. Of their sea-going qualities we have very satisfactory reports.

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NOTE.—Since the above pages have been in the press, it has become evident that the Chinese, a nation that is often said to be asleep, are evidently not disposed to turn, in these days of rapid and crushing events, to their War budget for the practice of that which is often called “economy,” a fact sufficiently patent from the subjoined extract from the English newspapers.

“The Chinese Government have recently ordered four more torpedo-boats of the Vulcan Company at Stettin, as well as 240 Edison lamps of a Stettin firm for lighting the armoured corvette Ting Yuen, the first ironclad in that yard for China. The same Government have also, it is stated, introduced the latest German plan of fortification in their new war harbour of Lushun-R’au, in the Liao-Tung peninsula. Two of the

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\* A *desyatina* = 2·86 acres. Trans.

forts, either completed or in course of construction, are to be strengthened by armour-plates, and it is considered very probable that one of German system, either Gruson's or Krupp's (armoured gun batteries), will be applied. The fort already completed has been armed exclusively with Krupp guns, and two others now building are to receive the same armament. The second of the Chinese ironclad corvettes was recently launched from the Vulcan Company's yard. It may be added that the present strength of the Chinese navy is stated to include two heavy ironclads (constructed in Germany), one monitor, two frigates, 12 corvettes (of which two are steel ships, built in England, of a speed of 16 knots), 30 unarmoured gun-boats (of which 13 are equipped for local coast defence), two paddle steamers, 10 excise steamers, and two transport vessels." Translator.

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## United Service Institution of India.

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*At a meeting of Members of the Council of the United Service Institution of India, held on Saturday, May 12th, 1883, it was proposed:—"That the cordial thanks of the United Service Institution of India be given to Major A. D. Anderson, R. A., for the very able and zealous manner in which he has carried out his duties of Secretary from May 1878."*

*The above Resolution having been placed before all the Members of the Council of the Institution present at Simla, it was agreed to, and it was further directed that the said Resolution be printed and published at the beginning of the next Journal.*

*By order of the Council,*

*W. E. GOWAN, Major,*

*Honorary Secretary.*

*Simla, July 1883.*



# ORIGINAL PAPERS.

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## I.

### CINERATORS AND SANITATION.

BY

VETERINARY SURGEON J. MILLS,

*Army Veterinary Department.*

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1. In a country like India, where there are so many domesticated animals, the proper disposal of the dead seems to me a question of paramount importance; although one evidently much neglected.

2. By burial, however deep, certain parts of the country in time must become more or less contaminated, and the atmosphere rendered impure and unhealthy, and dangerous both for man and beast to live in.

3. Burying is, without a doubt, the most insanitary mode of getting rid of the dead, and one which ought to be put a stop to, where practicable, by Government; and even the institution, if necessary, of stringent laws on the subject, although, perhaps, they might infringe on the private rights of the population, that consideration must be set aside, when, through improper sanitation, the lives of human beings are in danger.

4. I would strongly recommend the building, throughout India, of Cinerators, according to my plans hereto attached, not only for the purpose of cremating or reducing to ashes the carcasses of all animals that have died from such diseases as anthrax, or have been destroyed for glanders, but also for getting rid of all refuse or objectionable matter, such as dressings from wounds and sores, and the stable litter in stations where it cannot be utilized as manure, and where its accumulation becomes objectionable.

5. I am, perhaps, late in bringing this subject to notice, but it is to be hoped not too late to do some good; for I see no better or more effectual mode of getting rid of diseased germs than by fire, and, in fact, it is clearly evident that this is the only true way of preventing the spread of contagion.

6. Pasteur says that the disease germs of Anthrax (one of the most fatal animal scourges we have in India, and one whose increasing prevalence, no doubt, is due to the burial instead of the cremation of the dead) can travel long distances through the medium of earth-worms, and retain their vitality for a very long period. Is not such an authority as his enough to urge us to use proper and thorough means for the destruction of these germs, and in that way to remove the cause of the disease? For, while the cause exists, the effect will never cease.



7. In various parts in India, where we hear of outbreaks of disease amongst men and animals, should we not ask what are the causes? Might they not be due to the absence of proper measures for the disposal of the infected matter? But whether such be the case or not, I should very much like to see cineration given a trial.

8. Cinerators ought to be erected near all hospitals, cholera camps, sick lines for animals and bazaars, for the purpose of burning everything likely to convey disease or to prove insanitary.

9. As regards the question of fuel—for those for hospital use—in all stations where there are horses, it would be an easy matter to get a load of stable litter which I find answers the purpose well.

10. Now as to the cost of building a Cinerator made of mud or clay; a small one would cost only Rs. 8 or 9, and a large one for cremating animals in, would cost Rs. 16 or 18. Therefore, on the score of expense, there can be little objection to them. Clay is, of course, much to be preferred, as it forms a firmer and more permanent wall, and is less likely to be affected by the rains than mud; and in stations where it is procurable, I would strongly recommend its use. If they are to be constructed of brick, then we come into the subject of expenditure, which is always best to be avoided; but from two year's experience of the mud ones, I find they serve every requirement. They can be easily and readily put up, without the aid of skilled labor, and at a trifling cost, which is no small item in their favor.

11. To show what can be done with these Cinerators, I have been able, during the outbreak of glanders and farcy at St Thomas' Mount, to cremate the carcasses of eleven of the horses destroyed for the disease, and at Secunderabad I disposed of the carcass of a horse, that died from anthrax, in the same manner. The average time occupied in reducing them to ashes was about twelve hours per horse, and with no other fuel than stable litter. I think this is sufficient evidence of their utility, and I cannot help remarking that I look upon it as most satisfactory, for I have been able to effectually dispose of the carcasses of these animals while incurring but little expense to the Government, and saving the district from probable contamination by burial; and it also tends to illustrate how far many of the sanitary evils which now exist are subject to human control.

12. Of course cremation may be made much more speedy by the aid of wood, but I do not see that it is at all necessary, as the stable litter consumes the carcass quick enough for all practical purposes.

13. It requires very little consideration to see that the cineration of diseased matter is but a rational means for the preservation of health and the prevention of epidemic afflictions.

#### SITE.

14. The site for building them on should be selected where as much draught is procurable as possible, and where the smoke from the Cinerator will not become a nuisance or in any way interfere with the public health.

## BUILDING.

15. Where clay is not procurable, the wall must be made much thicker, especially at its base; in fact, to stand any time, it ought to be made nearly double that of a clay wall—See mud line marked 3 in plan I.

16. After the foundation is constructed, allow it to set for some days before beginning the superstructure; then build the first 3 feet of the wall, and allow that also to thoroughly harden before placing the stones on which to form the top or arch of the vent holes. After this you may build as quickly as circumstances will permit, care being taken not to be in too great a hurry.

17. I find the best men to employ as builders are the horse-keepers of the battery, for although they are not skilled laborers and require a good deal of watching, still they are well up in the erection of mud buildings.

18. A good foundation for the steps is a few loads of stones or large boulders.

19. When the Cinerator is finished and thoroughly dry, it ought to be well "lapped" over, and this operation repeated weekly, after all the cracks in the wall have been filled up.

## RULES FOR ITS USE.

20. (1). In filling the Cinerator for the first time, let as much straw as can be spared be placed in the bottom, so as to give the fire a start, and then gradually fill it up, and when half full, ignite the straw at the vent holes. After the walls are thoroughly heated, any material will burn.

(2). Care must be taken to keep the vent holes *well* cleared of ashes, to prevent "choking." This can be done by having a rake or fork made and secured to the end of a long bamboo.

(3). Clear the Cinerator entirely out every fortnight or three weeks, so as to make any repairs to the walls which may be necessary.

(4). For cremating a carcase, fill your Cinerator about three parts full with litter—see "litter line" marked No. 4 on plan No. 1—place the body on litter whole or in pieces, and cover over. From time to time supply plenty of fuel to ensure the thorough cineration of the carcase.

(5). During the rains have a large tattie made to place against the side on which the rain is beating, and construct a trench round it to prevent inundation.

## REMARKS.

21. As regards the building of the brick Cinerator, as shown in plan No. 2, that of course must be left to those who make such work their profession. I have never had the opportunity of seeing one at work, but have no doubt they would answer the purpose well, and if at all practicable, they ought to get a trial. Of course the cost of construction will, I am afraid, debar them from becoming generally used, except in large stations, such as Secunderabad or Bangalore, where one of them might be built for cremation purposes for the common use of the troops.

22. The ashes or charcoal from a Cinerator I have found most useful to throw down in stables where animals have urinated, acting by absorbing the urine, and also as a deodorizer. All that is required are a few heaps of the ashes distributed throughout the stable so as to be readily got at by the syces.

23. In conclusion, these Cinerators, like every thing else if we want them to succeed, must be personally superintended both in the building and in the working of them, as, if left to others, carelessness will probably bring them into discredit, and eventually disuse; but after two years experience of them, and having spent a good deal of time and trouble in bringing them to their present state, I can confidently assert that if built according to the plans I have submitted, and worked as laid down in this Report, they will be found valuable agents in a sanitary point of view.

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## APPENDIX.

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1. In the photograph accompanying this report, it will be observed that a derrick and tackle have been brought into use to lift the whole carcase into the Cinerator, but as the purchase and up-keep of this mode of working would be somewhat expensive, which I wish particularly to avoid, and not always available, I have invented the ramp and platform as shown in plan No. 3, so as to entirely do away with that arrangement.

2. The ramp is at a gradient of 1 foot in 5, which will not be found excessive. It is broad enough to allow a cart to be driven up which, when on the platform, can be turned round, tilted up, and the carcase, or anything else it might contain, slid into the Cinerator.

3. The platform I have designed as a place where, when an animal is to be destroyed, he can be shot close to the mouth of the Cinerator and then rolled in without trouble; and also as a place where all *post mortem* examination ought to be made, which seems to me highly essential as it is undoubtedly a bad and unsafe practice to allow these examinations to be made in the vicinity of sick lines or stables.

4. The 2 feet wall on ramp and platform is put up for the purpose of preventing the animal, when in the act of falling after being shot, from getting over the side. This wall I find to be necessary, because a few days ago I shot a horse on the ramp, on which he fell but the greatest difficulty was experienced in moving the carcase in, as, in rolling it over, the head or hind legs were always getting over the side, which caused a certain amount of delay; with the risk of it slipping off the ramp altogether.

5. So as not to make the platform and ramp too high, which would have increased the gradient, I have taken a portion of the wall out opposite the stage (see part of wall removed—No. 9 in plan 3), to bring the mouth of the Cinerator on a level with it. This portion of the wall which has been taken out will be found not to interfere in any way with the cremating powers of the arrangement.

6. The wall next to ramp must be straight—see figure 2 plan 3—as it is only natural to infer that if inclined inwards the mass of earth behind it will bring it down.

7. In constructing on this plan, build your ramp first and allow it to be thoroughly dry and hardened before beginning your Cinerator, for if not, the ramp is liable to give way and bring the whole to the ground.

8. This arrangement dispenses with one vent hole but I find three are ample, as I have had two Cinerators working on this system for sometime and they do well.

9. Of course I wish it to be clearly understood that this artificial ramp is not to be erected where a natural one can be found, either on the face of a hill or some other rising piece of ground, but as that is not always procurable, I submit this plan to overcome that difficulty.

10. Some may think that it is difficult to get a horse to walk up on the platform to be shot, but I have never encountered the slightest trouble yet in getting the animal close up to the Cinerator, as he suffers no mental agony, being in utter ignorance of what is about to take place.

11. Since writing my first report on this subject, I have seen the bodies of some human beings cremated by means of bratties, or dung cakes, which was most effectual, simple in the extreme, and inexpensive, and which might with advantage be made applicable to the disposal of the carcasses of the lower animals, more especially where it might be impracticable and unnecessary to build a Cinerator, in such instances as where a regiment or battery were on the march or where a sudden outbreak of disease gave no time to erect one. These bratties can be bought in the bazaars for about 2 annas per 100, but when a regiment or battery is in a station they ought to be made up by the sick-line syces in their spare time and stored away in stacks so as always to be ready for use when required. The way I saw them used was:—a pile was made of the bratties about  $1\frac{1}{2}$  foot high, then the body was laid on and more of them placed over it, which formed a regular mound, the whole was lit from below, and in a very short time little was left but ashes.

12. With the carcass of an animal, of course the difficulty would be in getting it on to the pile, but I think if it were simply laid on the ground and well covered with bratties and lighted, that cremation would rapidly take place. Of course if a hole were dug, say  $6 \times 4 \times 2$ , and filled with the dung cakes, the carcass placed over them and then well covered, there would, no doubt, be a saving in fuel.\*

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\*Since this report was made, Mr. Mills cremated the carcass of a glandered horse in his Cinerator with bratties, or dung cakes, in about five hours.

*Estimate for constructing a mud Cinerator, with plan No. 1.*

ST. THOMAS' MOUNT, May 1882.

| Item No. | Estimate of cost.                                                  | Total Estimate of cost. |    |    |
|----------|--------------------------------------------------------------------|-------------------------|----|----|
|          | <i>Detail of cost.</i>                                             | Rs.                     | A. | P. |
| 157      | Cubic feet excavating foundation, 3·50 per 1,000 feet ...          | 1                       | 0  | 0  |
| 592      | Cubic feet constructing a mud wall, at 2·00 per 100 cubic feet ... | 11                      | 0  | 0  |
| 4        | Granite stones, at 1·50 each ...                                   | 6                       | 0  | 0  |
|          | Total ...                                                          | 18                      | 0  | 0  |

The above estimate was made by the Executive Engineer, St. Thomas' Mount.

*Detailed Estimate for constructing a brick Cinerator for animal cremation, with plan No. 2.*

ST. THOMAS' MOUNT, May 1882.

| Particulars.                                 | No. | MEASUREMENT. |          |        | CONTENTS.    |
|----------------------------------------------|-----|--------------|----------|--------|--------------|
|                                              |     | Length.      | Breadth. | Depth. |              |
| <i>Brick in clay.</i>                        |     |              |          |        |              |
| Foundation to Cinerator ...                  | 1   | 44·00        | 3·00     | 3·00   | 396·00       |
| Superstructure do. (below) ...               | 1   | 44·00        | 2·50     | 4·00   | 440·00       |
| do. do. (above) ...                          | 1   | 37·00        | 2·00     | 12·00  | 888·00       |
|                                              |     |              |          | C. ft. | 1,724·00     |
| <i>Deduct.</i>                               |     |              |          |        |              |
| Door-way ...                                 | 1   | 4·00         | 2·25     | 6·00   | 54·00        |
| Arch-way ...                                 | 4   | 2·00         | 2·50     | 2·75   | 55·00        |
| Side of door ...                             | 2   | 6·00         | 2·25     | 0·75   | 20·25        |
| Flat Arch work ...                           | 1   | 5·00         | 2·25     | 1·50   | 17·00        |
| do. do. small ...                            | 4   | 5·25         | 2·50     | 1·50   | 79·00        |
|                                              |     |              |          | C. ft. | 225·25       |
| <i>Brick in Chunam.</i>                      |     | Remaining    |          | C. ft. | 1,498·75     |
| Side of doors. ...                           | 2   | 6·00         | 2·25     | 0·75   | 20·25        |
| <i>Arch Work in Chunam.</i>                  |     |              |          |        |              |
| Over door ...                                | 1   | 5·00         | 2·25     | 1·50   | 17·00        |
| Over Arch-ways ...                           | 4   | 2·25         | 2·50     | 1·50   | 79·00        |
| <i>Rough stone-work, including pointing.</i> |     |              |          | C. ft. | 96·00        |
| Foundation to ramps ...                      | 2   | 12·00        | 2·00     | 1·50   | 72·00        |
| Superstructure to ramp ...                   | 2   | 12·00        | 1·50     | 2·00   | 48·00        |
| <i>Excavation for foundation.</i>            |     |              |          | C. ft. | 120·00       |
| Cinerator ...                                | 1   | 44·00        | 3·00     | 3·00   | 396·00       |
| Ramp ...                                     | 2   | 12·00        | 2·00     | 1·50   | 72·00        |
|                                              |     |              |          | C. ft. | 468·00       |
| Iron door complete ...                       | 1   | 4·00         | 0·00     | No.    | 1            |
| Iron work—bar for grating ...                | 1   | 350·00       | 1½"      | 1½"    | lbs. 2628·50 |

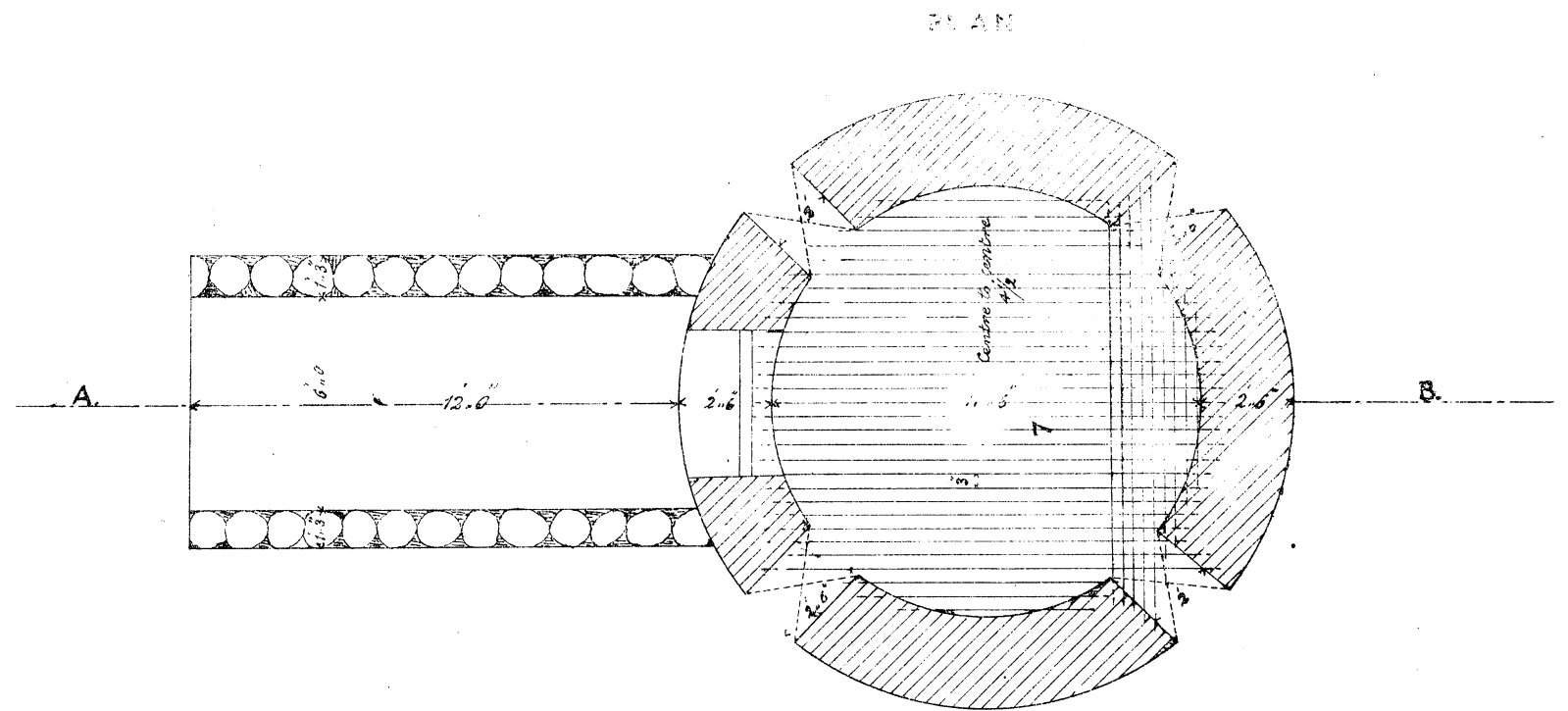
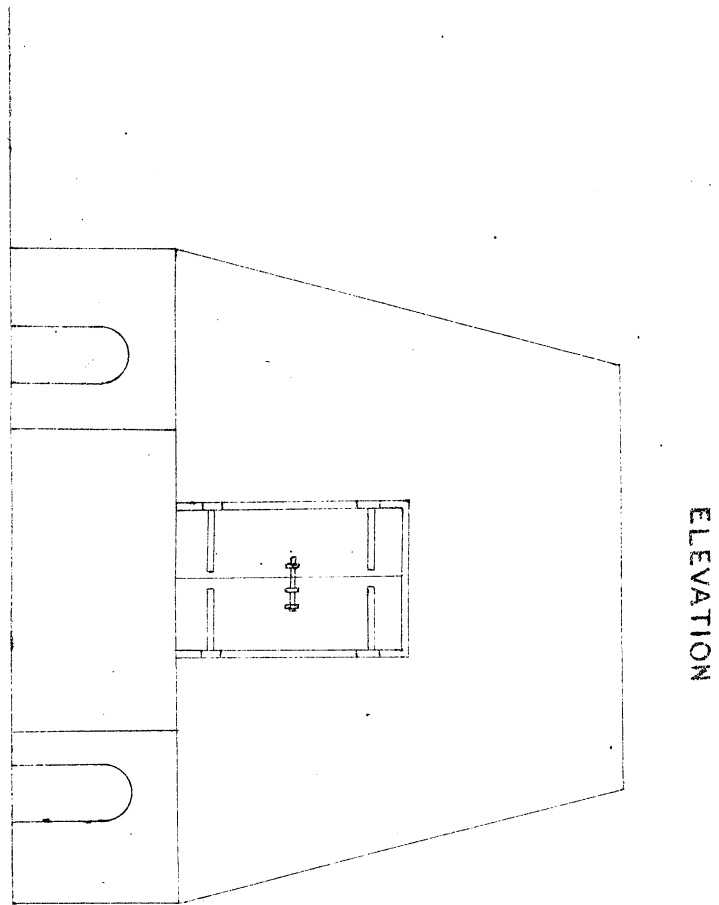
*Abstract Estimate for constructing a brick Cinerator for  
animal cremation, with plan No. 2.*

ST. THOMAS' MOUNT, May 1882.

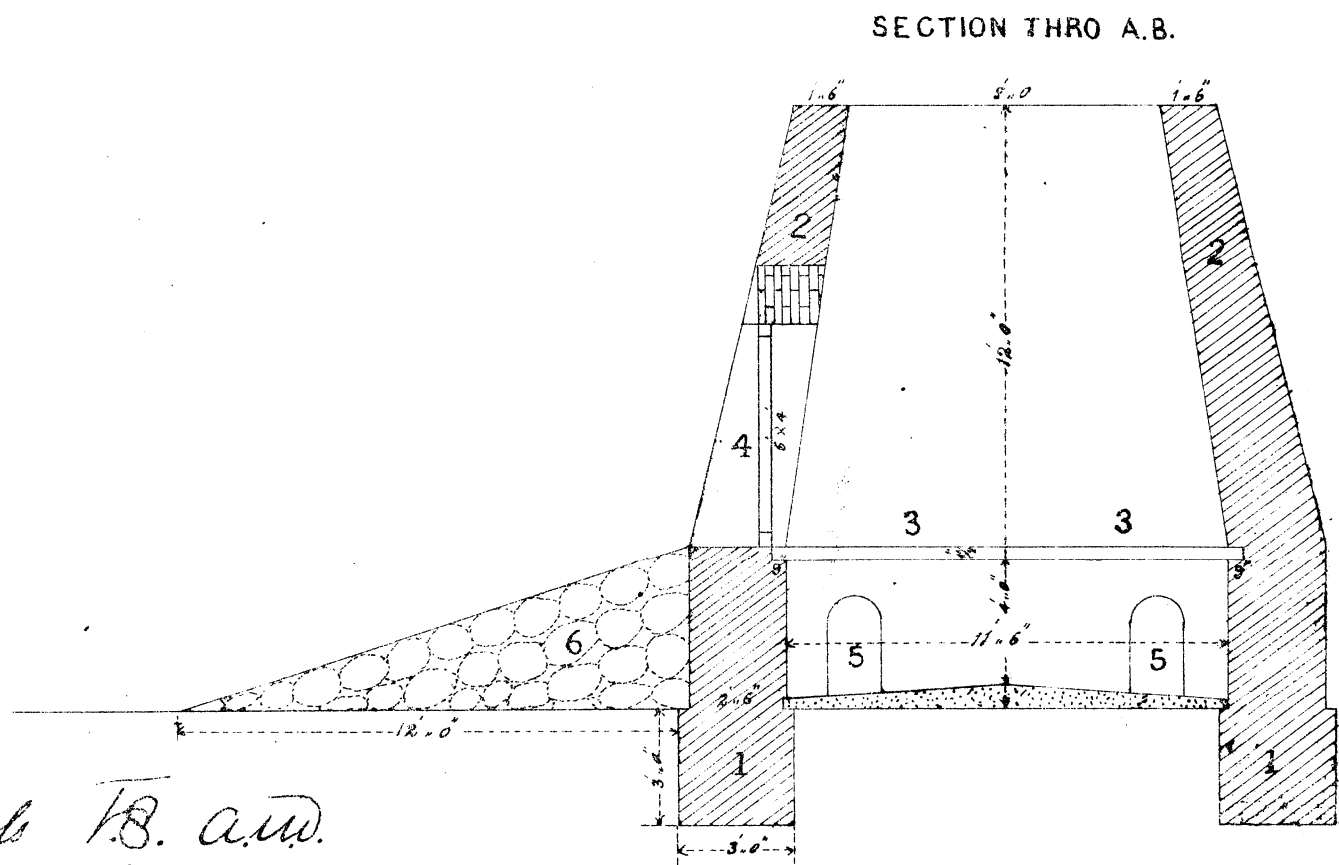
| Quantity. | Description.                                       | Rate. | Per.                | Amount. | Total. |
|-----------|----------------------------------------------------|-------|---------------------|---------|--------|
| 1499      | C. ft. Brick in clay ...                           | 12·00 | 100· c. ft.         | 180     |        |
| 96        | do. Arch work in<br>Chunam ...                     | 25·00 | do.                 | 24      |        |
| 20        | do. Brick in Chunam                                | 16·00 | do.                 | 3       |        |
| 120       | do. Rough stone<br>work, including<br>pointing ... | 5·50  | do.                 | 7       |        |
| 468       | do. Excavation ...                                 | 4·00  | 1000 c. ft.         | 2       |        |
| 1         | No. Iron door (4 × 6)                              | 50·00 | each.               | 50      |        |
| 2629      | lbs. of square iron bar<br>for grating ...         | 30·00 | 500 lbs.            | 158     |        |
| 8         | Square ft. of plaster-<br>ing, 1 coat ...          | 1·50  | sq. ft.             | 12      |        |
|           |                                                    | Total | Estimate, Rupees... |         | 436·00 |

If old rails are used for grating instead of new bar iron, the estimate would be Rs. 79 less, or Rs. 357.

# Plan & Section of a Cinerator for animal Cremation



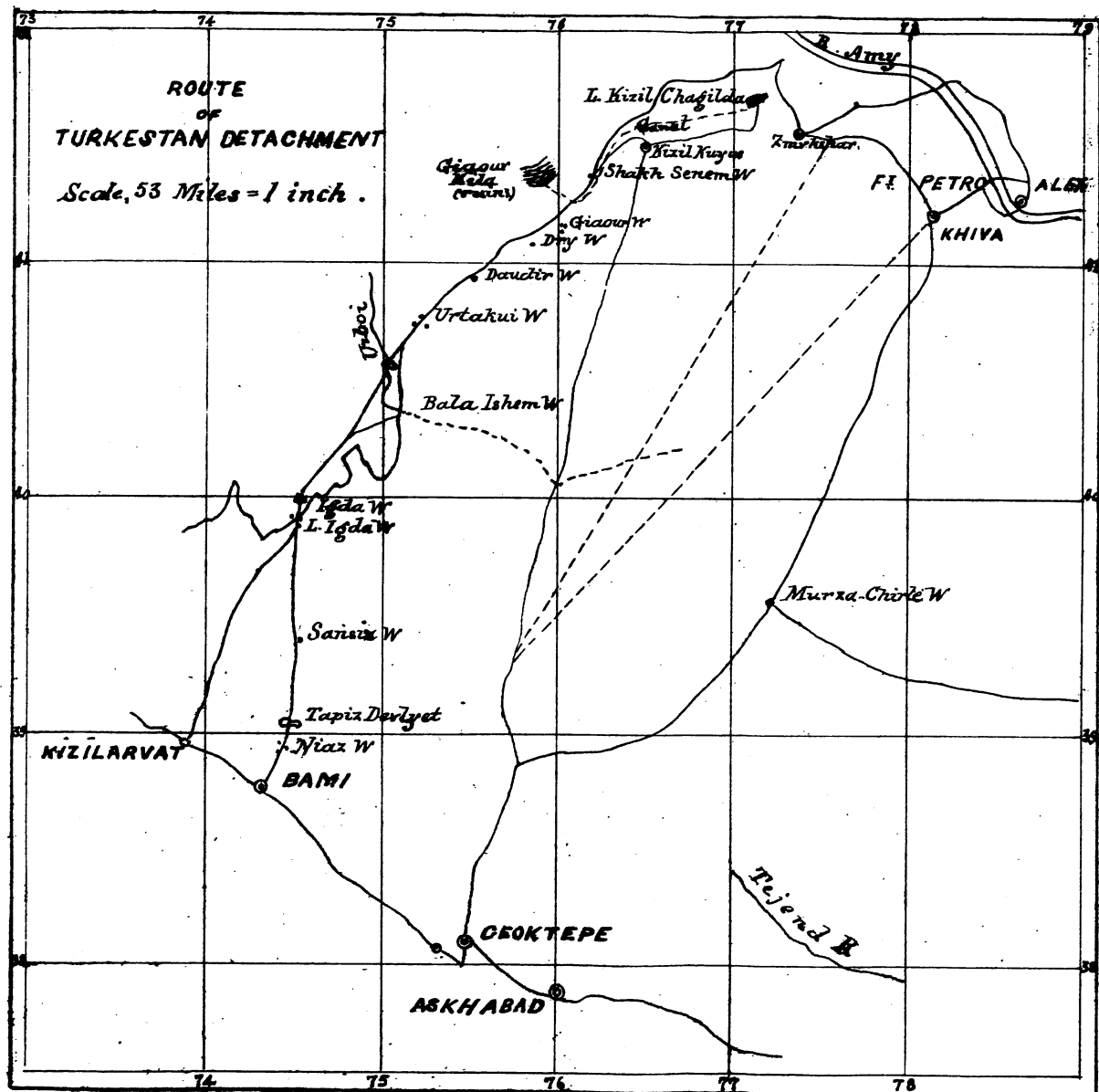
- 1 FOUNDATION
- 2 WALLS
- 3 GRID
- 4 DOOR
- 5 VENT HOLES
- 6 RAMP
- 7 GRID SHEWING SQUARES.



(Sd.) James Mills T.B. and  
St. Jos. Mount  
May-1882.

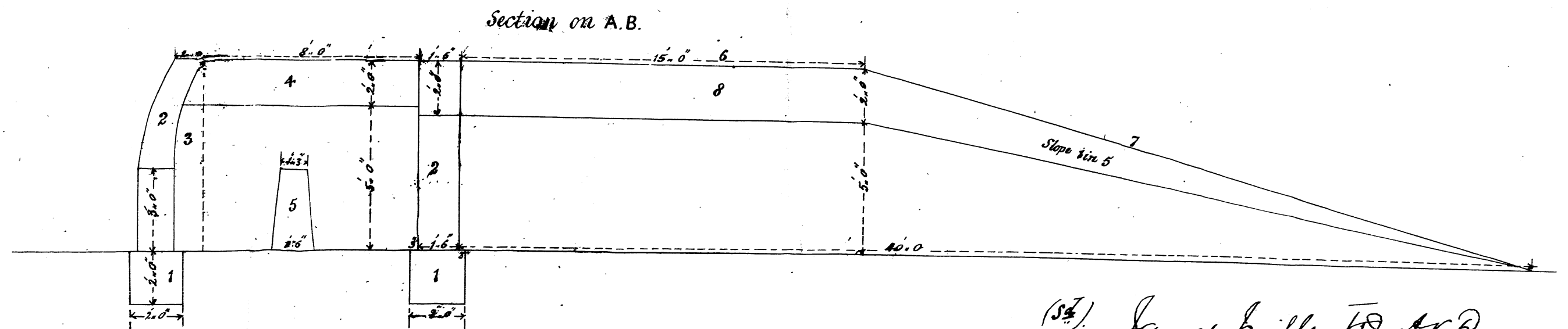
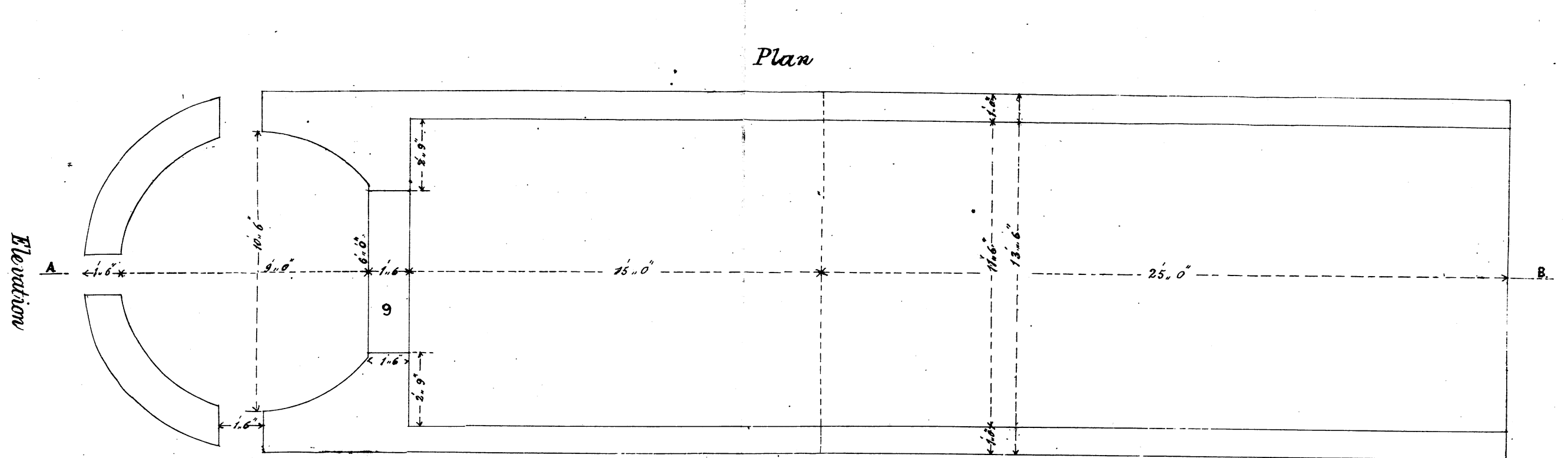








# Plan of Cinerator with ramp & platform.

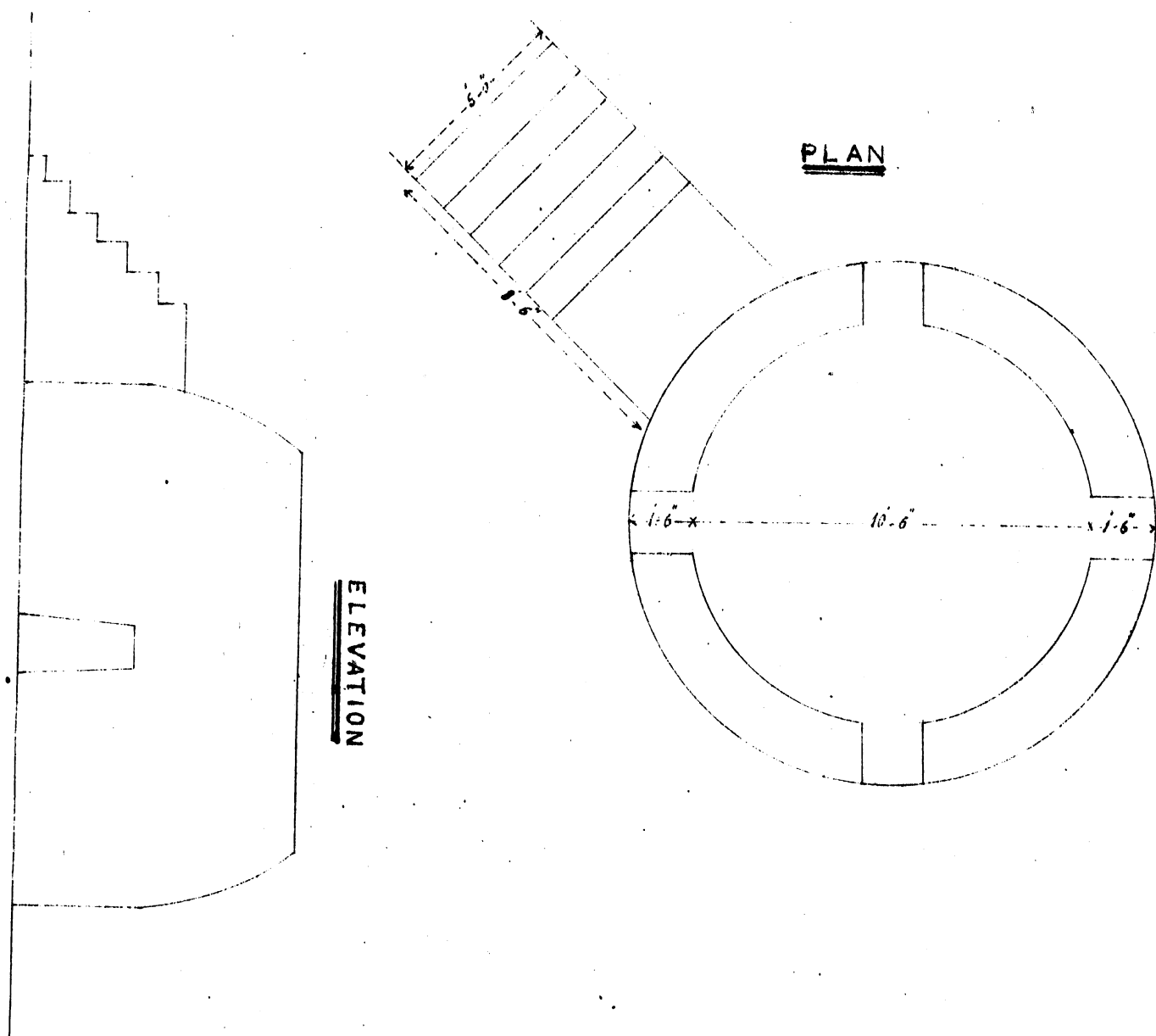


- 1 Foundation
- 2 Wall
- 3 Mud line
- 4 Litter line
- 5 Vent hole
- 6 Platform
- 7 Ramp
- 8 Wall
- 9 Part of wall removed

(S.I.) James Mills. F.B. A.R.D.  
St. Louis, Mo.  
May 1882.



# EXISTING CINCERATOR AT ST THOMAS'S MOUNT



- 1 Foundation
- 2 Wall
- 3 Mud Line
- 4 Litter Line
- 5 Vent Hole
- 6 Stair

*St. James Hills, F.S. and  
Mount May 1882*



# NOTE TO VETERINARY SURGEON MILLS' REPORT UPON CREMATION.

BY

GRIFFITH EVANS, M. D., C. M.,

*Inspecting Veterinary Surgeon, British Army.*

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The want of some cheap and effectual means of cremating infectious carcasses, &c., has long been felt by Veterinary Surgeons who have devoted their minds to sanitation. That the infecting virus of some diseases is not destroyed by the death and burial of the patient, has been placed beyond doubt by many observers, and it has been proved repeatedly that the grass growing on the graves of horses and cattle affected with anthracoid diseases, or where such carcasses have been left exposed on the surface of the ground, is extremely liable to communicate the disease to other animals which eat it.

About four years ago I noticed the grass-cutters of a cavalry Regiment, at an anthracoid station in India, cutting grass in a field where all the infected carcasses had been buried, and I duly warned the responsible authority, but he took no heed, because the grass growing there was uncommonly good looking, and he thought the alleged danger was imaginary because the graves were deep. The grass was given to the horses, and in less than seven days afterwards, five of them died of anthrax and several others were seriously ill. I quote the following from the address of Charles Cameron, M.D., L.L.D., M.P., on *Micro-organisms and disease*, delivered in the Health Department of the Social Science Congress last year, published in the British Medical Journal, 8th October 1881 :—

“ \* \* \* \* So tenacious of life are these spores in the case  
“ of the bacillus of splenic fever that M. Pasteur has found them in  
“ full vitality in pits in which oxen and sheep that had died of the  
“ disease had been buried for ten years. He has proved, too, that when  
“ thus buried, swallowed by earth-worms in the soil from which these  
“ derive their nourishment, they are brought by them to the surface,  
“ and may thus give rise to fresh outbreaks of the disease. He found  
“ that this was the case in an instance where a bullock had been  
“ buried in a pit over six feet deep. His proofs were absolutely con-  
“ clusive. He placed sheep on the ground, and they took the disease.  
“ He separated the bacillus-germs from the earth by washing it, and  
“ multiplying them by cultivation, found that by inoculation they pro-  
“ duced the disease. He found them especially in the casts brought to  
“ the surface by earth-worms, and in the contents of their digestive  
“ organs ; and he found, further, that in districts where the soil was of  
“ such a nature that earth-worms were rare, the disease, when acciden-  
“ tally imported, was not found to spread. Here is an anecdote which  
“ curiously illustrates how scientific discoveries may come about. In  
“ 1865, Baron Seebach was Saxon Minister at Paris. Having suffered  
“ severely from splenic fever on his estate, he took great interest in the



"subject and conversed with the French Minister of Agriculture respecting it. The result was that he was asked to detail his experiences in a memorandum. The Memorandum the French Minister placed in M. Pasteur's hands, and it seems to have given him the clue to the manner in which the disease is spread. It has recently been published. In it, the Baron narrates various circumstances which had induced him to think that his enormous losses from splenic fever were due to the propagation of the disease from the graves of the dead animals. But what confirmed him in his suspicions was this:—a sheep that had died of the disease had been buried in the corner of a field on which a crop of corn had subsequently been grown and which the following year was sown with clover. The attention of the Baron had been accidentally directed to the place at the time; and one day, in passing, he remarked that the clover had grown with exceptional luxuriance over the spot. A few days later he noticed that some one had stolen the clover which grew at that corner of the field. The next day a woman on his property came to him weeping and said that her goat had just died, and her cow was very ill. The disease was found to be splenic fever; and the woman confessed it was she who had stolen the clover, and given it to the unfortunate goat and cow."

I am aware that Dr. Koch of Berlin has more recently cast a doubt as to whether the spores brought up from graves by earth-worms in M. Pasteur's experiments were those of the bacillus of anthrax or of the bacillus of a kindred disease which he differentiates from it under the name "*Malignant Edema*;" but that does not affect the question of the real danger there is in allowing animals to feed on grass obtained from the graves of infectious carcasses.

The annual loss to India from anthracoid diseases among cattle is enormous, and it is certain that the carcase of every animal that dies from them is a focus from which the infection is spread by different media. The skins and hair of anthracoid animals imported from the continent of Europe to England carries also the infection to men as well as to beasts, as has been proved by the Committee which investigated the outbreak of "*Hair-Sorters Disease*," at Bradford last year.

Rinderpest, and other fatal enzootic diseases, are also spread by the skins of carcasses both in Europe and in India. When I was stationed at London, Canada-West, in 1866, a fatal case of Hydrophobia in a currier was brought to my notice by the physician who attended him: the man had never been bitten by any animal, but it was discovered he had curried the skin of a cow that died of the disease from the bite of a mad dog. He did not know what the cow died from, so it was not any effect upon his imagination, and whether the skin was the source of the virus or not, it certainly could not be accounted for in any other way.

In this country the natives never trouble themselves to bury the carcasses of dead animals, which are allowed to pollute the ground and air where they die, or be devoured by jackals, vultures, crows, &c., which carry the infection elsewhere.

Since cremation can be done so cheaply as Mr. Mills' shows, there ought to be a law making it criminal not to cinderate the entire carcase of every animal that dies of infectious disease ; a cinerator should be erected convenient to every village.

Mr. Mills' Cinerator may be made at a nominal cost, small enough for use in private compounds, to consume stable litter and house refuse, which many now find it difficult to dispose of. Colonel Gloag, Commanding Royal Artillery at the Mount, had one made for that purpose and he is greatly pleased with its operation.

I am of opinion that Sanitary Officers all over India would find it exceedingly valuable for destroying much of the sweepings of bazars which are now often the means by which the virus of disease is cultivated and spread about.

There are some stations, such as Secunderabad in Madras, and Seetapore in Oudh, where the Authorities have to pay the natives for removing the stable litter every day, because there is no demand for it as manure. The cinerator should be in constant use at such places.

In cities and towns where gas is made for lighting, much of the refuse of bazars and slaughter houses, and the carcases of all diseased animals, could be advantageously consumed in the furnaces of the gas works or in the retorts where they would be converted into gas. Mr. F. Vacher, Medical Officer of Health, Birkenhead, in a paper which he read at the Annual Meeting of the British Medical Association in Worcester, last August, said.—“There is but one efficient way of destroying diseased meat, and that is by cremation. This is most readily “done at any contiguous gas works, where the carcase can be cut up “and packed into the retorts. The district I serve, on one occasion “destroyed in this manner a single seizure amounting to (59,280) “Fifty nine thousand two hundred and eighty pounds, in a few days, “without inconveniencing the gas works.”

The hydrocarbonaceous elements of carcases would be a rich contribution to the gas retort.

OOTACAMUND ;      }  
10th October 1882.    }



## II. MILITARY COLONISATION.

BY  
CAPTAIN MARTIN, R.E.

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Although England is the largest Colonial power of this or any other century, and also one of the greatest military empires, the foundation of military colonies has always been excessively distasteful to the British mind. This is peculiarly odd as the feudal system, one of military land tenure, has produced the Yeomanry of the country, the guardians of public liberty, a class above all others which it is sought to preserve and foster and which in this country meets with its representative in the Native Silladar Cavalry, one directly connected with the land, which may be looked on as Yeomanry embodied for longer periods than is usual in England.

If we look to other nations, we find that the Romans of old, and the French and Russians of modern times, have always resorted to military colonisation, and if the French have not been uniformly successful, it is due more to their faults as colonizers than to the fact that the colonies have been military. On the other hand, the Russians have been singularly successful with Cossack colonies under far greater difficulties than we are likely to experience. Many of our own colonies have originally been strictly military colonies. Among these may be mentioned the plantation of Ulster, an example of a successful military colony, founded under the greatest difficulties, in a country where the previous attempt in Munster failed altogether, and where the succeeding attempts by Cromwell and other able men were also disastrously unsuccessful.

On the whole, however, the balance has been on the successful side in colonial projects, most of them begun by military or semi-military expeditions, and ending in civil, settled occupation ; and where failure has occurred, it has been either from national unfitness or from faults in method which are clearly traceable and which, perhaps, serve better to guide future efforts than to discourage attempt. If we turn to India, we see that very little worthy of the name of colonization has been attempted ; but in spite of ourselves, the English instinct for trade and adventure is beginning to form small colonies of Indigo, Tea and Coffee planters here and there. The danger of a native rising or military mutiny is appreciable. These colonists band together for defence and form Volunteer Corps and our hold on the country is considerably strengthened at a very trifling expense. Here the argument will be advanced that these are only the colonists of the moment ; that the Indian climate, even in the hills, is unsuited for permanent colonization ; that the third generation of pure European blood cannot be raised, but that the breed dies out unless replenished from home. To

all this, I would answer that probably very few Europeans do or will ever spend their whole lives in India, but that, though the individuals change, the settlement retains a permanent colonial character, that the fresh supply from home will always be forthcoming, and that settled occupation of a colonial character is the only method of facing the half-breed problem which has never been resolutely grappled with yet. Military colonization also offers, perhaps, the only chance of ever eventually reducing military expenditure on the Standing Army proper,\* and increased facilities of transit home and out have already vastly reduced many of the difficulties and may be expected to continue to do so further. In addition, a military occupation, which has no permanent influence on the tenure of land in the country, is a great waste of force. Certainly colonization does not mean "India for the Indians;" still less does it mean "Perish India," but in this matter we should be satisfied with the substantial benefits we have conferred on the country and which our future rule will, it is hoped, further augment. We can best secure the "happiness of the million," &c., by tightening our military tenure of the country, securing it both from disturbance from within and from attack from without. The cheaper we can manage this, the better for the millions, but the security is after all the main point.

How then should we attempt to strengthen our hold by a more permanent form of military occupation than the mere residence of troops in garrison?

It is easier to propound the question than to dictate the answer—easier to see the necessity than to find the triumphant conclusion. To my mind, the best solution that presents itself, and which I advance in all humility, lies in the association of territorial divisions of the home army (British Infantry), with suitable tracts of hill territory. This brings us straight to the favourite military resource, a "table," which I append, reserving the discussion to follow.

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\* *N. R.*—However fluctuating the civil population, it has already given us in India a Volunteer armed force of about 10,000 men—a considerable addition to our military insurance against disaster.

| PROVINCE.          | No. of Battalions. | Territorial Regiments.                                          | Old Numbers.                                                | Hill Station. |
|--------------------|--------------------|-----------------------------------------------------------------|-------------------------------------------------------------|---------------|
| Wales ... ..       | 6                  | Royal Welsh Fusiliers.<br>Royal Welsh.<br>S. Wales Borderers.   | 23rd 41st<br>24th 69th                                      | The Gullies.  |
| Ireland ... ..     | 16                 | Royal Irish, &c.                                                | 18th 86 89 101 104<br>27 87 94 102 108<br>83 88 100 103 109 | Ranikhet.     |
| Scottish Lowlands  | 8                  | Royal Scots., &c.                                               | 1st 26th<br>21st 90th<br>25th                               | Dalhousie.    |
| Scottish Highlands | 11                 | Royal Highlanders,<br>&c.                                       | 42nd 73 79<br>71st 74 91<br>72 75 92<br>78 93               | Abbotabad.    |
| Lancashire ...     | 14                 | East, West,<br>South Lancashire, &c.                            | 4th 8th 20 30 40<br>47 59 63 81<br>82 96                    | Quetta.       |
| Northumbria ...    | 8                  | Northumberland,<br>Durham, Derby,<br>Border.                    | 5 34 55<br>45 95<br>68 106                                  | Chukrata.     |
| Yorkshire ... ..   | 12                 | E. W. York. &c.<br>and York & Lancaster.                        | 14 15 19<br>33 51 65<br>84 105 76                           | Neilgherries. |
| Western England..  | 8                  | Cornwall,<br>Devon,<br>Dorset,<br>Somerset.                     | 11 13 32<br>46 39 54                                        | Darjeeling.   |
| Central ,, ...     | 8                  | Bedford,<br>Berks.<br>Oxford, Northampton.                      | 16 43 49<br>52 66<br>48 58                                  | Dhurmshala.   |
| Midland ,, ...     | 10                 | Warwick,<br>Leicester, N. Stafford,<br>Shropshire, S. Stafford, | 6th 17 38 80<br>53 85<br>64 98                              | Solen.        |
| West Central ,, .. | 8                  | Cheshire,<br>Worcester,<br>Gloucester,<br>Wilts.                | 22nd 28 29<br>61 36<br>26 99                                | Jutogh.       |
| Eastern ,, ...     | 8                  | Lincoln,<br>Suffolk,<br>Essex, Norfolk.                         | 9 10 12<br>44 56                                            | Murree.       |
| Southern ,, ...    | 8                  | Sussex,<br>Surrey, E. and W.<br>Hants.                          | 2nd 31 35<br>37 67 70 107                                   | Subathu.      |
| Home Counties ...  | 8                  | Middlesex,<br>Kent, E. and W.<br>Royal Fusiliers.               | 3rd 7 50 57<br>77 97                                        | Dugshai.      |
| Rifles ... ..      | 8                  | Rifle Brigade,<br>King's Royal Rifles &<br>Rifle Brigade.       | 60th                                                        | Landour.      |
| TOTAL ...          | 141                |                                                                 |                                                             |               |

In the table it will be observed :—

1st. That the regiments are grouped in clumps of about eight (in one case 16, in another 14, &c.). To each group of eight is assigned a hill station ; those of larger dimensions than 8 battalions being assigned the largest hill stations.

The scheme would then be that each hill station would be occupied by a regiment or battalion of its own group.

It is assumed that at least one of the group would be in India at a time.

(There is, at present, only one Highland Regiment in India for instance).

2nd. It would (it is thought) then follow that a greater interest would be taken in the station\* and in improving the surroundings than is done at present, and that the great evil of idleness and want of occupation, which is so much felt by all Regiments who have been quartered in the hills, might be, at least partially, overcome.

The selection of the stations has not been made quite at random in the table.

For instance, Chakrata has been allotted to the Northumbrian province, and among the Regiments part-owning it (in the table), are the 55th who built the station, and the 5th Fusiliers who now occupy it.

And this brings me to the point from which I have been led to devote a good deal of attention to the subject of Infantry in the hills.

The 55th, who built Chakrata, was the only Regiment that has ever thoroughly enjoyed a hill station, and this solely because they were busy and occupied and interested in the work they were engaged in. A third year in Chakrata was given them as a reward for their exertions, (a privilege most regiments would not value), and to this day many of the Regiment retain their affection for what is, after all, a very stupid out of the way place.

I believe, therefore, that if no further advantage is gained, a certain sense of ownership and possession will create interest ; and the fact of a territory at home being connected with a territory in India, will tend towards producing a pride on the part of Regiments in their conduct and industry in their associated locality. Also, I can hardly believe that such a measure would fail to produce a corresponding degree of interest in the home province with its Indian Military Colony. Such civil settlers as a Regiment never fails to attract, would, in time, come to be natives of the province.

Of course such a territorial connection is not as strong in some instances as others.

\*N. B.—The great curse of the army at present is a feeling of insecurity produced by recent "improvements."

This acts most prejudicially on the interest taken by the Regiment, as a body, on officers, men and surroundings.

Of an officer or man it is commonly said — " he will leave us to-morrow for the Staff Corps or reserve ;" of a station " we are only here for 2 years and the station may be abolished"—neglected houses and gardens testify every where to the diminished interest taken compared with old times. It is not desirable that Regiments should be stationary in any sense, but some permanence in the result of their labour is necessary to secure that the labour is heartily performed.

In the "Home Counties" group, it might be weak. In the "Yorkshire" group, it might be stronger marked.

It is also probable that such men of the regiment who were permitted to remain in India on leaving the colours would, in many cases, settle in the vicinity of the Regimental Hill Colony. So far from discouraging pensioners or reservists from doing so, they should, in my humble opinion, receive every encouragement to remain.

The lot of a reservist on his return home is not always very enviable. Accustomed to have a great deal of care taken of him, and probably ignorant of a trade or means of livelihood, he may consider himself lucky if he winds up in some town or country police. It is not all who are so fortunate. During its stay of 2 years, the Regiment might do a great deal in a hill station. It would not be difficult each year to clear the land for 3 or 4 farms or tea gardens, orchards or plantations, and erect the necessary buildings.

At the end of the year these holdings might be offered as rewards to deserving soldiers taking their discharge, the whole regiment to ballot for them, and the Colonel to possess the power of veto only in cases where bad characters were elected; which cases would be very rare.

Men dropping into any of these holdings, whether a farm, a small plantation, a shop, &c., &c., would, of course, be liable to be called out as reservists with the Regiment of their province then quartered in the Hill station near which they had squatted. Again, it would rest with the Officer Commanding on what terms he would permit men in the Regiment to labour for the surrounding Regimental squatter reservists. These terms would naturally be light in the case of harvesting, &c., &c. but might include the formation of a fund for the further extension of the provincial colony. Very little assistance would be needed from Government. Wherever possible, the supplies needed by the Regiment would be produced by the local squatters. Boots, furniture, &c., &c., would probably be procurable, as well as food supply proper. Like jails, possibly there is here some interference with free trade, as an artificial stimulus would be given by the regiment, the advantages, however, appear to over-rule the objections. It would probably be found possible to utilise the squatters in many ways for the public advantage, in the conservancy of forests, extension of communications, &c., &c.

I have, however, written quite enough for readers to fill in the future from their own imaginations. The project, such as I have sketched out, cannot, I venture to think, do harm.

If attempted, and the position of Infantry Regiments in the hills is in no way improved by the attempt—well—we are as we stand now.

If on the contrary some such system met with any success—even here and there only—it would furnish us with valuable data for future contingencies should our empire ever be extended to Asiatic countries more suited to the European than even the hills of India.





### III

#### THE GOVERNMENT TRANSPORT SCHEME,

BY

LIEUTENANT E. G. BARROW.

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It is with much satisfaction that all soldiers who have the interests of the Indian Army at heart regard the progress now being made in providing it with an efficient transport service, which will enable it, in future, to take the field without those harassing delays and vexatious annoyances that were so often experienced in 1878-79.

The lavish waste and insuperable difficulties caused by the want of organization during the Afghan war, are now bearing fruit. The necessity for maintaining a peace organization was then so forcibly demonstrated, that hardly had the last troops re-crossed the frontier than the Government commenced making efforts, in the face of a large war debt, to constitute a permanent nucleus of transport during peace to meet the exigencies of war.

In less than two years those efforts, tentative though they may have been, met with their due reward in the acknowledged success and efficiency of the Indian Transport Service during the Egyptian expedition. But the scheme, satisfactory as it has already proved in its incomplete condition, does not yet justify us in considering that all that can be done has been done, nor that that high standard of efficiency has been reached, with which a wise and economical Government may rest content.

The chief—the most striking blemish in the scheme, is its expansive nature and its failure to recognise the fact that it is trained men we most require to maintain in peace, and not trained animals. A certain sum is put aside by Government for the organisation of a Transport Department, and the Director of Transport provides for that sum the maximum number of animals, with their due proportion of attendants which the country can afford to maintain. But this, I think, is not the primary object to be kept in view when organising a transport department. It is not the greatest possible amount of carriage in peace that the army and country demand, but a system which, by its expansive nature, shall efficiently supply in war the needs of as large a force as the annual allotment made by Government can reasonably be expected to provide.

How this blemish can be remedied is a question which presents many difficulties, and I am far from saying that the remedies proposed in these pages are either the best that can be suggested or that they are even feasible. They may, however, clear the ground for those who, from their technical experience and official knowledge, are fitted to

grapple with so difficult a question, by indicating what appear to an on-looker to be the weak points in the official scheme, and the direction in which reform will be most salutary and desirable.

The scheme, as approved by Government, provides for the maintenance of half transport for a certain number of regiments on or near the frontiers of the empire—in all for 46,130 men—and it also provides for the creation of transport dépôts at the principal strategic points, with carrying power equivalent to 28,000 maunds. We may thus be said to stand in a far better position, as regards readiness for war, than we have hitherto; still there is much left to be desired. The scheme practically only provides for the half transport of combatant corps, and in the event of any conflict on a large scale, such as the Afghan campaign was, we have not only to find the remaining 'half transport' but we have to raise and equip the various supply columns, which carry the *Munitions de bouche et de guerre*, the present scheme offering no organization of a sufficiently reliable nature to meet the demands of a serious war. Theoretically, the Transport Dépôts would supply these demands, but practically they would, to a great extent, be absorbed in completing the regimental transport, unless indeed the regimental transport was left to complete itself from local resources, in which case a very large untrained element would be introduced into that portion of the transport which should be the most efficient. Still, to have one half of our regimental transport a trained body, is indeed a great advance on our former condition, and one with which we may well be satisfied if no remedy can be found. If, however, a remedy can be found without increasing expenditure, this point must admittedly be a blemish in the Government transport scheme. This scheme shows clearly, and in the minutest detail, how it is proposed to expand the units maintained at the various transport dépôts, and here this blemish, this want of elasticity, becomes intensified, for instead of doubling we have to quadruple or quintuple our trained establishments with such raw material as we may be able to collect by the liberality of our terms or by the indirect pressure of subordinate native officials. The result of such a method of mobilization must be considerable delay and comparative inefficiency in the great supply columns which would accompany the army in the field, and which, considering they supply the bread and bullets—the passive and active power of the force—should be as highly organised and efficient as circumstances will admit.

Now, that which renders transport efficient is the efficiency of its *personnel* in officers and men and that efficiency can only be thoroughly secured by peace training. Therefore, the greater number of men you can train in peace the more numerous will be your trained *personnel* in war, and the greater the efficiency of the transport generally. These are axioms which it is impossible to dispute, and which, if granted, demonstrate that every effort should be directed, every means adopted, to increase that *personnel* without incurring increased expenditure. There are, it seems to me, two ways of effecting this:—

1st. By reducing the number of animals so as to admit of the entertainment of a larger number of men.

2nd. By employing all additional men in peace as syces for the Artillery and Cavalry, in the same manner as the moveable column 'Kahars' used to be utilized for punkah pulling.

Let us take these projects separately. According to the calculations given by the Director of Transport, the cost of food for a bullock, or mule, is about Rs. 7 per mensem, while the cost of a transport follower, including clothing and compensation for dearness of provisions, is about the same. Under the official scheme one transport follower attends three animals, the same number that he would attend in war, therefore, the cost of three animals per mensem is, including the attendant, about Rs. 28. On the same data two animals with one attendant each, would cost a like sum, so that if we reduce the number of animals maintained in peace by one third we can double the number of attendants, a plan permitting greater expansion in war than is possible under the existing one. To make my meaning clearer, let us take a unit of 300 bullocks. The one hundred men maintained in peace are only just sufficient for their management; any expansion must be met by employing entirely raw and undisciplined men. If we required to double the strength of that unit, we should have to entertain 100 men, and 300 bullocks. About the bullocks, of course, there would be no difficulty; the enlistment of men would, however, involve some delay besides being unsatisfactory in result. On the other hand, if instead of 300 bullocks and 100 men, the peace unit were 200 bullocks and 200 men, we should be able to provide for a similar carrying capacity of 1,200 maunds by merely entertaining 400 additional bullocks, the *personnel* for which we already have, 200 men being sufficient for the whole 600 bullocks, the difference simply being that we should have to entertain more bullocks but *no* men, a difference which, slight as it may appear to a casual observer, is one of radical importance when put to a practical test. There is no difficulty in procuring a hundred bullocks, more or less, and the efficiency of the transport service is not involved therein, but it is involved in the efficiency of the men, in obtaining whom both delay and difficulty will assuredly be experienced. The proposal then amounts to this that, instead of keeping up three times as many animals as we have attendants, we maintain in peace as many men as we do animals, enabling us to treble the number of animals in war without enlisting another man. A system which would give us two thirds of our present carrying capacity in peace, but enable us to double our present peace establishment in war-time without impressing a single man and without any loss in efficiency.

The official scheme proposes to maintain something over 9,000 mules and bullocks, with 3,000 attendants, exclusive of artificers, farriers, etc.; it does not, however, admit of our adding one single bullock or mule without a proportionate augmentation in drivers; on the other hand it

finds ample and reasonable employment for the whole 3,000 men on the establishment. Alter this as I propose and you have 6,000 men and 6,000 animals capable of being expanded on the out-break of war to 18,000 animals without the addition of a single man, but with, as I have already said, the drawback that every one of the 6,000 men will have comparatively nothing to do in peace time unless other employment be provided.

There is, however, one obvious objection to this, which is, that an increased number of men with a decreased number of animals to attend to, would have a totally insufficient amount of work allotted to them, for by this system no man would have more than one animal in his care. This defect has, however, a remedy which is what I have already adverted to as the second great resource for increasing the *personnel* of the transport department without a corresponding increase in expenditure—namely, to employ in peace all superfluous followers of the Transport as syces of British Cavalry and Artillery.

This idea is one of a very novel and radical nature, but is, I think, worth considering. The standing reproach against the Indian Service is the extraordinary crowd of followers which form an integral part of that army. Now, if by thus utilizing the services of these followers we can form a large reserve of men available for Transport work in war, we shall in a great measure remove that reproach, and the fact we now have to deplore, namely, the maintenance of a multitude of followers, will become an actual source of strength, and an enormous gain to the offensive capacity of the Indian Army. How these men can be thus utilized is the point next to be discussed.

Now, as I propose to maintain only 6,000 bullocks and mules, it is obvious that 2,000 men are really sufficient for their care, the remaining 4,000 thus become available for other purposes. I am not aware how many syces are required for the nine cavalry regiments and all the mounted batteries on the Indian establishment, but I imagine it must be something considerably over 6,000. It may be objected that a corps ordered on service will hardly be in a position to return *all* its syces to the Transport on the requisition of that department, and that objection I am fully prepared to admit; but a corps proceeding on service is only accompanied by syces for 15 per cent. of its horses, the remainder, therefore, can easily be spared. Moreover, it is scarcely credible that more than  $\frac{1}{3}$  or at most  $\frac{1}{2}$  of those regiments and batteries would ever at one time be employed on active service, and the remainder could, without difficulty, restore to the Transport Department the men required for duty therewith. It is most improbable that we shall often have in the field a larger force than the 60,000 men employed beyond the Indus in 1879-80, and then even, great as was the occasion, and mighty the effort, never more or as much as one third of the British Cavalry or Horse and Field Artillery in India, was at one time in the field. It follows then that if the spare transport followers be distributed as syces throughout the cavalry and artillery in India, two-thirds at least may always be reckoned on as available for duty

with the Transport Department, the deficiencies in corps thus drawn on being met by entertaining men locally or, in the worst case, by doing without them. Presuming, however, that 4,000 Transport followers only are distributed among the mounted corps and that one-third of the artillery and cavalry is called on for service, it might happen that one-third of those 4,000 followers could ill be spared by the corps to which they were attached; it would, therefore, be wiser so to increase the number of surplus followers that two-thirds of the whole number would give at least 4,000 men. That is to say, if we want to make sure of being able to draw on the mounted branches for 4,000 Transport followers without crippling corps ordered on service, we must attach at least 6,000 Transport followers to the mounted branches. This means that an additional 2,000 men must be maintained, and 2,000 men mean a monthly average expenditure of 14,000 Rs.; but this sum is more than saved by employing 6,000 drivers as syces for the cavalry and artillery. If not so employed, 6,000 other syces would have to be entertained, and 6,000 syces mean, one thing with another, very nearly 30,000 Rs. a month, a saving which it is just as fair to calculate to the credit of the Transport Department as the saving effected in punkah pulling by utilizing the services of Commissariat "Kahars."

Let me summarize this. I propose to maintain a transport establishment of 6,000 mules and bullocks with 8,000 followers, in lieu of 9,000 animals and 3,000 men, and this establishment would not only be less expensive but also more efficient in that it is more elastic.

## COMPARISON OF COST.

|                                                                          |     |     |           |        |
|--------------------------------------------------------------------------|-----|-----|-----------|--------|
| 9,000 animals at                                                         | ... | ... | Rs. 7=Rs. | 63,000 |
| 3,000 drivers "                                                          | ... | ... | " 7= "    | 21,000 |
| TOTAL "                                                                  |     |     |           | 84,000 |
| 6,000 animals at                                                         | ... | ... | Rs. 7=Rs. | 42,000 |
| 8,000 drivers "                                                          | ... | ... | " 7= "    | 56,000 |
| TOTAL "                                                                  |     |     |           | 98,000 |
| Deduct 6,000 men employed regimentally as Syces at Rs. 5 per mensem =Rs. |     |     |           | 30,000 |
| BALANCE Rs.                                                              |     |     |           | 68,000 |

Or Rupees 16,000 per mensem less than the cost of the present system.

The result of such a change in organization would be :—

1st. That instead of 3,000 drivers we should have an establishment of 8,000 men, of whom 2,000, or  $\frac{1}{4}$  only, would be actually employed by the Transport Department in time of peace.

2nd. That on the out-break of war, regiments and batteries supplied with transport on the peace scale, would be able to complete their transport to the Kabul scale by merely trebling their establishment of animals, which under a proper system of registration and contract, ought to be no very difficult matter, and by calling in transport syces attached to mounted corps near at hand.

3rd. That the transport maintained at the various dépôts would remain available for the formation of the supply columns of the Ordnance and Commissariat, and that it could be trebled in amount without any appreciable strain.

4th. That a saving of Rs. 1,92,000 per annum would be effected.

5th. That the Cavalry and Artillery Syces will no longer be a necessary evil, but an unqualified good.

As explained above, 2,000 drivers only would in peace be attached to the department, the remaining 6,000 being affiliated to mounted corps throughout India. To insure, however, the practical efficiency of the whole 8,000, every man of them should pass through the ranks of the Transport establishment, serving one or two years therewith, before being drafted to a mounted corps for duty as syce. Thus, broadly speaking, every man would spend two years with the Transport Department, and the next six with a mounted corps, being liable, however, during the whole period to revert to duty with the Transport, a plan which is essentially an application of the Reserve system to a non-combatant branch of the army. It would, however, be advisable to lay down as a rule that no driver should be absent from Transport duty for a longer period than six years at a time in order to prevent loss of efficiency.

The ideas above enunciated are not new ones—the germ thereof may be found embodied in the Essay on Transport for which I had the honour of receiving the Gold Medal of the United Service Institution. The principles and details of augmentation will be found laid down *in extenso* at pages 20—23 of that essay; for then as now I insisted that you could not have a thoroughly elastic system of mobilisation without maintaining in peace as many men as animals. That principle rests on a mathematical basis, and is a sort of ‘rule of three’ which is, I believe, the foundation of any sound system of organisation. I did not, in that essay, propose to find employment for what were really in peace superfluous hands, because I then contemplated the possibility of making the Transport a body capable of bearing arms and defending itself, much as the Povindahs and Afghan camel drivers do to this day; but public opinion and the action of Government both show that that proposal embraced a fundamental error which I now cannot but admit. The classes from which we get our transport followers are recognized on all sides as unsuited to bear arms, and as we cannot afford to maintain a number of men in comparative idleness we must cast about for other employment for them. I now, therefore, abandon the idea of combatant Transport companies in favour of a system by which our surplus trans-

port followers would be employed in peace as regimental syces. I am aware that camel drivers are not men we could thus utilize, and the above suggestions refer only to the mule and bullock drivers, the latter being, as far as possible, employed as Artillery *Drabies*. As regards the camel *Surwans* I still hold to my original idea. The camel driver of the Punjab and the Afghan border is a man who possesses fighting qualities which are not to be despised, and I still urge that camel troops, such as those sketched in the gold medal essay, with such modifications in details as experience and convenience suggest, might with advantage be formed, while the *Surwans* attached to corps might be more or less trained by the regiments to which they are attached.

It may be worth while to contrast the two schemes from other points of view. *First*, as regards regimental transport. The Official scheme gives half transport on Kabul scale to 46,130 men, but with no facilities for augmenting that transport except by drawing on the Transport dépôts or by recruiting locally. Whereas the suggestions contained in these pages amount to the maintenance of  $\frac{1}{2}$  transport for the same number of troops, with a large reserve of men distributed throughout India, thus enabling corps to complete their transport without any serious interference with other branches of the department. In addition to which, mounted corps, other than the favoured 46,000 frontier troops, would all have a nucleus of transport followers, which nucleus could not but facilitate the introduction of regimental transport in those corps if the occasion demanded. *Second* as regards the mobilization of transport units, a comparison between the figures given in tables A and B will, I think, more clearly show the advantages of the scheme.

| Nature of Unit ...    | A.<br>Official establishment. |         | B.<br>Proposed establishment. |         |
|-----------------------|-------------------------------|---------|-------------------------------|---------|
|                       | In Peace.                     | In War. | In Peace.                     | In War. |
| Mules or Bullocks ... | 250                           | 1,000   | 200                           | 600     |
| Drivers... ..         | 92                            | 366     | 200                           | 200     |
| Camels ... ..         | 100                           | 500     | 100                           | 300     |
| Surwans ... ..        | 37                            | 184     | 100                           | 100     |



In the mule corps, for example, war entails the entertainment under the one scheme of 274 drivers and 750 animals, or as there are 12 such units, of no less than 3,288 men, a number which will only be procured after much delay and which, when collected, will consist only of an undisciplined mob of coolies ignorant of their special duties. Under the other scheme the depôts are certainly not as expansive as those framed on the paper organization given in table A, but on mobilization the practical difficulty of obtaining men will not be experienced, and the contemplated 600 animals will be far more rapidly mobilized and placed on an efficient footing than would even the same low number under the sanctioned organization. As regards the camel corps, if we must rely on hired men and animals, if the military or rather semi-military training of Lobana Sikhs, Shinwaris, Waziris, and Punjabis generally is impossible or too extravagant to be contemplated, then perhaps the official scheme is the best that can be devised and one with which we may well rest content.

The following table shows the distribution of these several units under either scheme.

| STATIONS.          | A.      |        |           | B.      |        |           |
|--------------------|---------|--------|-----------|---------|--------|-----------|
|                    | Camels. | Mules. | Bullocks. | Camels. | Mules. | Bullocks. |
| Pindee ... ..      | 200     | 500    |           | 100     | 400    |           |
| Mian Mir... ..     | 100     |        |           | 100     |        |           |
| Meerut ... ..      | 100     | 500    |           | 100     | 200    |           |
| Sepree ... ..      | 150     |        |           | 100     |        |           |
| Allahabad ... ..   |         |        | 250       |         |        | 200       |
| Assam ... ..       |         | 250    |           |         | 200    |           |
| Jacobabad ... ..   | 250     |        |           | 100     |        |           |
| Mhow ... ..        |         | 250    |           |         | 200    |           |
| Poona ... ..       |         | 250    |           |         | 200    |           |
| Secundrabad ... .. | 120     |        |           | 100     |        |           |
| Bangalore ... ..   |         | 250    |           |         | 200    |           |
| Madras ... ..      |         |        | 250       |         |        | 200       |
| Rangoon ... ..     |         |        | 500       |         |        | 200       |
| TOTALS ... ..      | 920     | 2,000  | 1000      | 600     | 1,400  | 600       |

The difference in peace between the two schemes as shown above is not a radical one as regards distribution, but most certainly is as regards power of mobilization, for in the one case you have to get men, beings endowed with a certain amount of will and liberty of action, who may not care to participate in the honors and hardships of a distant and arduous enterprise, while in the other you have only to obtain dumb animals, creatures having neither will nor voice in the matter, whom money will always purchase.

There are other minor points in the Transport scheme which demand attention, and which, doubtless, time and experience will cause to be rectified; details of organization also which have yet to be provided for, but these are matters for the Transport Department to consider. It is general principles alone that the public have a right to challenge or criticize. I am aware that in thus publishing views at variance with official ones I lay myself open to misconstruction and perhaps even ridicule. I can only say in self defence that I have been actuated solely by the desire to invest the subject with some further attention and consideration before it is finally disposed of. I have in this paper merely criticised and contrasted certain general principles of organization, and I trust, if in doing so, I have seemed presumptuous or arrogant, that it will be believed that, mistaken or not, I have only the interests of the service at heart. It is from no captious disposition—in no querulous spirit that I have written this article, but solely with the desire of aiding in the solution of that most difficult problem, the organization of the Transport service.

LUCKNOW,        }  
*March 1883.*    }

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## IV.

### "TRANSPORTED" VERSUS "MOUNTED" INFANTRY

BY

LIEUTENANT CECIL, M. MAGUIRE,

*Madras Staff Corps.*

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Military opinion has, on the whole, been favourable to the recent introduction of Mounted Infantry as an arm of our service. The advantage accruing from moving troops rapidly and placing them fresh on the battle field to fight on foot has been recognized from the earliest times. The results obtained from the application of the principle have never hitherto been so striking as they appear likely to become in modern warfare.

The great want felt by Cavalry on outpost, and all other detached duties, is an Infantry support, keeping pace with its movements, whereon it may rally when driven in and from which it may obtain assistance in attacking small forces of Infantry in position.

The employment of a certain number of dismounted cavalry soldiers to supply the place of Infantry is open to many objections. Cavalry is the most expensive in training and equipment of the three arms. The lance and sword, so necessary for the cavalry soldier's equipment on horse back, is in his way when dismounted, and would, therefore, have to be left with his horse from which he might easily be separated by the accidents of an engagement. Besides, by causing him to act dismounted the advantages of his special training are lost. The best *sabreur* may prove an indifferent foot soldier. The expense of providing him with a good trained charger, the most important and characteristic arm of his service, is rendered of no avail. An extensive course of training is required to place him on a level with a fully drilled Infantry soldier, and enable him to act contrary to the traditions of his service.

The only instances in history of the really successful employment of Cavalry, performing both its own especial duties and those of an accompanying Infantry force, in modern warfare, are the splendid achievements of the American Horse on both sides in the war of 1861-5. The circumstances under which this Cavalry was raised were very exceptional. The Confederate, which was by far the best, was in great part composed of the gentlemen of the Southern States, men of high intelligence and courage, practised horsemen and sportsmen. Both sides had an opportunity of obtaining their training in four years of incessant war. Such material and means of gaining experience are only available when a whole nation is at war. Owing to the difference of the conditions, the American Horse does not offer the English army an example it can profitably follow. Our Cavalry is too small a force to supply the necessary quota of dismounted men to support their

own service. Supposing them raised to a sufficient strength, I have already shown them to be unfitted for Infantry duty on account of the waste of money and time entailed in training a man as a horseman and then obliging him to fight on foot. These remarks are not intended to refer to those cases in which the employment of dismounted Cavalry is both legitimate and necessary. In most engagements a force of Infantry is a necessary auxiliary to Cavalry. It is the designed employment of dismounted horsemen to supply the place of an Infantry force, against which these remarks are made.

The general rule for the training and armament of troops applies equally to Cavalry, to render them qualified to act in the most effective manner under all circumstances. Many opportunities would occur for the advantageous employment of dismounted horsemen. These occasions would, however, be exceptional, and the general rule should be laid down that Cavalry should never act dismounted unless when unable to act as effectively on horse back.

The recent proposal by a Cavalry officer to form special Regiments, composed of the marksmen of the other Cavalry Regiments, to fight, except in exceptional cases, on foot, seems strangely at variance with the accepted principles of the employment of that service. A good Cavalry has many and important duties of its own to perform without infringing on the province of Infantry, and its presence with an Army now is quite as indispensable as in any former time.

As Cavalry is unsuited to furnish a force to fight on foot on all occasions, of course Infantry must be employed. Mounted Infantry are selected from those light men who happen to be good shots. They are trained to ride and are supposed to dismount to fight. This is a distinct improvement on the use of dismounted cavalry. The Infantry soldiers, picked men of their service, are of course superior to the dismounted horsemen on the battlefield. The tactical divisions of the force remain distinct. The Cavalry and Horse Artillery can engage in enterprises against the flanks and rear of a force engaged by the Infantry in front, and repulse similar attacks from the enemy, in neither of which duties could the Cavalry engage if occupied in holding the horses of their dismounted comrades. For out-post duties, all detached operations against communications and convoys, and in pursuit, it may be assumed that the Army possessed of a bold Cavalry, restricted, when possible, to its own especial duties and excelling in them, supported by an efficient Horse Artillery and a proportionate force of mounted infantry, should certainly be more than a match for a force equal in aggregate numbers of Cavalry and Horse Artillery relying on dismounted men as substitutes for supporting Infantry.

Mounted Infantry is an improvement on dismounted Cavalry but it has very serious defects. It is a very expensive arm. Though the horses need not be up to the Cavalry standard or training, they must be good useful animals, and they are made use of for no purpose except transporting the men from place to place. The soldiers have to be trained to ride and look after their horses. This specialises the service

too much and renders it inexpansive. With these trained horsemen present in the field, along with the Cavalry, it would, after a time, be difficult to tell where the Cavalry soldier's duties would end and the Infantry man's begin. Of course it would be laid down that they are only to act as Infantry, yet in special emergencies, such as pursuits, they might be occasionally (and under the circumstances very properly as being for the moment their most advantageous use) employed as Cavalry, then good bye to Mounted Infantry. The service is more especially inapplicable to our Army as it is so small that a sufficiently large force would never be maintained in addition to the present Cavalry establishment. On the occurrence of any large war, the Mounted Infantry would have to be absorbed in the Cavalry, to raise that arm to its proper strength. Indeed it is difficult to see the difference that there would be between Mounted Infantry and Light Cavalry, some time after the formation of the corps, except in name. The soldiers would have to learn Cavalry drill to a certain extent to enable them to move as a body, and the officers and ranks being composed of men fond of riding and with a leaning towards the Cavalry service, it would in effect be Cavalry. Though it would always remain superior to Cavalry for its particular duties, it suffers from a defect which renders it almost useless in large bodies, namely, the fact that, at the utmost, more than two thirds of the men are never available for fighting, the remainder being employed in taking charge of the horses. This is allowing only one man to three horses which would probably, on actual service, prove too large a charge, and so the fighting portion would have to be further reduced. Any feasible plan that could remove or diminish this defect could not fail to be an improvement. If the special training of the individual horses were practicable, such as that of the Boer's ponies used in the late war in the Transvaal, which stood quietly by themselves while their owners were firing, mounted Infantry would certainly be theoretically better than it is, though even then its expense would be excessive. Such highly trained animals are no more obtainable in regular Armies than the superior individual shooting power of the Boers can be attained by the practice of range firing. In India the difficulty might be met by the employment of trained syces, who, running beside the horses, could easily accomplish thirty miles a day. This plan would take away the power of doing forced marches. The employment of an accompanying force of native followers on horses or ponies to hold the English soldier's horses would be effectual but it would occasion great additional expense and add considerably to the crowd of followers who form the bane of Asiatic warfare.

As the only use of the horses to Mounted Infantry (while they remain Infantry) is to enable them to move quickly from place to place, it remains to inquire whether a system of wheeled transport could not be devised which would carry the troops equally well and be both cheaper and more suitable for the purpose.

As in warfare troops never move in large bodies except along roads, and even when Cavalry is extended on out-post duty the supporting Infantry would always be sufficiently near if drawn up near a road, it may be taken for granted that roads would always be available for

the passage of Infantry supporting a Cavalry advance or for larger bodies. Shortly after the Franco-German war it was suggested that Vans should be used for the transport of Infantry. The plan was rejected principally, if I remember rightly, because the proposed vehicles were open to attack without any power of effective retaliation, as the soldiers could only get out one by one. The faults in the shape of one particular description of vehicle should not be sufficient to condemn all wheeled transport. If a vehicle of a pattern similar to that of the long car at present used in Ireland were adopted, the defects noticed in the vans would be obviated. The shape of the car is that of the well known jaunting car, except that it holds four on each side besides the driver. It would be a very difficult vehicle to assault. On the appearance of the enemy on the flank of the line of cars, the soldiers, who would sit with their rifles between their legs, would get off and form a line of skirmishers ready for immediate action. This supposes a flank attack; in warfare this would be a very rare occurrence as the Cavalry scouts would extend on the front and flanks of the line of cars. On notice being given of the enemy's approach, the men would get down, each carload forming a convenient section for skirmishing. The sections in front would form a line of skirmishers, those further in rear, supports and reserves. The cars would be retired to a safe place in rear and packed. Nothing can exceed the convenience of this system for moving Infantry. The soldier requires no training beyond that of his own arm, a marked advantage over hybrid Mounted Infantry, who have all to be partially trained Cavalry. Another advantage is the great expansiveness of the service; the only limit to the number of transported Infantry will be the number of cars available. The soldier comes into action fresh, accompanied by his own officers and well supported by the other arms. He is completely equipped and accoutred as an ordinary soldier, so that, if by any chance the cars are lost, the Infantry remains. Mounted Infantry on the contrary depend on their horses, being equipped as horsemen, which deducts much from their value on level ground where cover for their horses is not easily procurable and where they are most required, as the Cavalry can then best follow up any advantage gained by them. The disintegration of the troops employed as a makeshift Mounted Infantry, such as that employed in Egypt recently, of which the officers, non-commissioned officers and men were all selected from different Regiments, contrasts very unfavorably with transported Infantry who could move by complete Companies, Regiments or Brigades.

If adopted for use in the army these cars could be made very light. It would be convenient to make them with interchangeable parts. The pole and drawing gear should be adapted to fit at both ends of the car to avoid the inconvenience of turning it. A pair of horses would be yoked in the curricie fashion as seen in the tongas in this country. In the event of one of the horses being killed or disabled, and a spare one not immediately procurable, a spare shaft, of which one could be provided for every two cars, could be made use of, being fitted into a socket prepared for the purpose, so that one horse could take the car to the rear. The well of the car would be available for a variety of uses. A

supply of food, or ammunition and grain for the horses, might be placed in it, care being taken not to make the load too heavy. Fodder could be carried in a net under the car. The well would be covered with a leather cushion, and the top of it would serve as a couch for a wounded man. These cars, when not in use, could easily be placed in stores where they would suffer no deterioration, as would be the case with the horses of mounted Infantry. The car horses, when not used for their especial purpose, would be available for general Commissariat duties: employment could usually be found for them. Each car would have its complement of entrenching tools attached to it as they are in the Artillery. Besides being available for their usual use, in case of an obstruction to the road, the sections on the leading cars could repair it, every soldier detailed for the duty being an instructed pioneer, as every Infantry soldier should be in these days of field fortifications. The car relieved of the weight of the men could certainly pass over any ground practicable for Horse Artillery.

The drivers would be drilled soldiers, specially instructed in their duties and armed with carbines and revolvers, so that when the cars were placed in a larger formation they could be drawn up as an escort. Spare cars would be of value in transporting the sick and wounded.

If the comparative cost and advantages of an Infantry Battalion of 900 of all ranks be considered, first, when organised as mounted Infantry, and again as transported by cars, the advantage to be gained, and the saving to be effected by the latter method, are very apparent.

In the case of the Mounted Infantry 900 horses at £40 each would cost £36,000. The saddlery equipment and extra pay to the men as a service would all entail large extra charges. If forage were not plentiful on the line of operations, the provision of extra transport, to provide food for so large an extra force of horses, would be a severe strain on the supply department of the army. Special arrangements would have to be made for the supply of ammunition. A large peace establishment would have to be maintained for the instruction of the men.

A similar Battalion provided with car transport would require 200 horses for 100 cars, 50 spare and 20 for ammunition waggons (distributed one to each Company and two in reserve); these would, at the same price as above of £40, amount to £10,800; the cost of the cars and ammunition waggons would not exceed £4,000. Only one hundred men would require special training and extra pay. The cars and their harness would not require the constant renewal necessary for a supply of horses.

Thus the initial cost of the one is £ 36,000, of the other £15,000—less than half. But this is not a fair way of putting it; the £36,000 is really the cost of 600 men, for the men in charge of the horses are, for all fighting purposes, as useless as if they did not exist. The £15,000 represents the cost of 900 men, all of whom are available for fighting, though one hundred are formed into a second reserve. The cost of a Mounted Infantry soldier, without taking into consideration his expensive special training, equipment, extra pay, and the keep of his horse,



amounts to £60, for no account can be taken of the non-effectives with the horses. The cost of the transported Infantry soldier, besides the saving effected in the special training and other matters mentioned above, is less than £17 per man. This difference of cost, so large in the individual and the Regiment, would be very great in the case of a Brigade or Division, and forms a strong argument in favour of wheeled transport. It is true that economy is a weak argument, as when expense and efficiency come into opposition there can be no hesitation in deciding in favour of efficiency, this is, however, a case in which a great saving can be effected without the slightest risk of damaging the efficiency, as the soldiers conveyed by wheeled transport would be, if anything, better than the horse foot soldiers. In one small army the waste of so large a portion as one third of the effective strength, as entailed by Mounted Infantry, is a drawback which must condemn the use of the arm if any substitute can be found for it. Were one experimental corps of cars with trained drivers introduced into our army it would cost little and could not fail to have a good result. An excellent opportunity would be offered for the employment of the special corps, as the necessity for a method of enabling the Infantry of our army to be transported rapidly is beyond dispute. The greatest master of modern warfare has placed his opinion on record that doubling the distance troops can traverse in a given time is equivalent to doubling their numbers. We have so few soldiers that we should lose no opportunity of giving such advantages, and I hope I have been able to some extent to prove that in no way can the transport of Infantry be more effectually or economically carried out than by the employment of wheeled transport.

This is a subject concerning which I can lay claim to no originality. The idea of employing horses and chariots to convey men into action to fight on foot is older than the use of Cavalry, being the method of the Assyrians and of the heroes who fought before Troy. The suggestion of the Irish jaunting car as affording the most suitable pattern for a vehicle to transport Infantry I have borrowed from a military correspondent to the 'Pioneer.' Still the subject is one of so much importance to the army that it deserves more consideration than it has hitherto received. If I have been able to indicate the applicability of wheeled transport to our army and to prove the superiority of transported Infantry both to dismounted Cavalry (only, however, when so employed in cases in which it can act on horse back) and Mounted Infantry, the object with which this paper was written has been fulfilled.

# V.

## MEDALS AND HONORARY DISTINCTIONS,

GRANTED UNDER THE ORDERS

OF

*The Government of India,*

A PAPER BY COLONEL F. B. NORMAN, C.B.

*24th P. N. I.*

[The object of this paper is to give an account of the Medals and Honorary Distinctions which have been granted for services performed, either on the continent of India, or by expeditions organized and despatched under the orders of the Government of India. I purpose following, as closely as practicable, the plan adopted by Carter in his "Medals of the British Army," and in order to prevent the paper extending to too great a length, I shall avoid, as much as possible, reference to Medals which have already been described by Carter.]

Medals, as rewards for services rendered by British soldiers, were first bestowed by Charles I. during the Civil War. The idea originated with Thomas Bushell, Warden of the lead mines in Cardiganshire and one of the Masters of the Royal Mint at Oxford, and at once met with the approval of the King, who issued the following Proclamation :—

"Charles R."

"Trusty and well beloved, We greet you well. Whereas We have received information, that those souldiers which have been forward to serve Us in the Forlorn Hope, are not looked upon according to their merited valour and loyal service, We do therefore require that henceforward the Commander-in-Chief both of horse and foot which lead out the Forlorn Hope, upon whom We mean to bestow special tokens of Our Princely favour, do signify in writing the names of those souldiers whom they find most forward in serving their king and country, that care may be taken to reward their deservings, and make them specially known to all Our good subjects. For which end We have thought fit to require SIR WILLIAM PARKHURST, KNT, and THOMAS BUSHELL, Esq., Wardens of Our Mint, to provide from time to time, certain Badges of Silver, containing Our royal image and that of Our dearest son Prince Charles, to be delivered to wear on the breast of every man who shall be certified under the hand of their Commander-in-Chief to have done Us faithful service in the Forlorn Hope, and We do therefore most strictly command, that no souldier at any time do sell nor any of Our subjects presume to buy or wear, any of these said Badges, other than they to whom We shall give the same; and that under such pains and punishment as Our Council at War shall think fit to inflict, if any shall presume to offend against this Our Royal Command, and We further require the said Commanders and Wardens of Our Mint to keep several Registers of the Names of those, and of their country, for whom they shall give their certificate."

*"Given at Our Court at Oxford. the eighteenth day of May 1643."*

"To Our trusty and well beloved Sir Thomas Parkhurst, and Thomas Bushell Esquire, Wardens of Our Mint at Oxford."

The first Medals were given for the battle of Edge hill, where the King's standard bearer, Sir Ralph Varney, having been killed, the Royal standard fell into the hands of the Parliamentarians. At this time the men of the rival armies were only distinguishable from one another by the colour of the scarf they wore. Those of the King's army were white, whilst those of his opponents were orange. Taking advantage of this, a Royalist officer—Captain John Smith, of Lord Grandison's regiment of horse—putting an orange scarf over his shoulder, rode amongst the enemy, and snatching the standard from the man who was bearing it, galloped off and laid it at the feet of the King, who that evening made him a banneret, and afterwards gave him a gold medal with the Royal profile on the obverse, and the Royal standard on the reverse, and directed that it should be worn suspended by a green ribbon.\*

Robert Welch, an Irishman, assisted in this exploit, and the following order regarding him is registered in the Herald's College :—

"Charles R."

"Our will and pleasure is that you make a medal in gold for Our trusty and well beloved Sir Robert Welch, Knight, with Our figure and that of Our dearest sonne Prince Charles, and on the reverse thereof to inculpe ye form of Our royal banner used at ye battail of Edge hill, where he did Us acceptable service, and received the dignity of Knight-hood from Us, and to inscribe about it, *PER REGALE MANDATUM CAROLI REGIS HOC ASSIGNATUR ROBERTO WELCH MILITI.*"

*"Given at Our Court at Oxford this 1st day of June 1643."*

The example set by the King was followed by his enemies, who struck a medal for the victory gained by them over the Royalist forces at Naseby on the 14th June 1645. Another was given for the defeat of the Scottish army at Dunbar, bearing on the obverse the head of Oliver Cromwell, with the date, September 13th, 1650, and on the reverse, a representation of the House of Commons in session. This medal was struck both in gold and silver, one of which, according to his rank, was given to each officer, non-commissioned officer, and private present in the action. Shortly after the battle of Dunbar, a medal, known as the Parliament medal, was instituted; it appears, however, to have been but sparingly bestowed. Medals were also granted for the more important naval actions fought during the commonwealth.

With the restoration of the monarchy, the practice of awarding medals for military and naval services appears to have fallen into abeyance, and was not resumed until the reign of William and Mary, when a gold medal was given to each of the officers engaged in the defeat of the French fleet at the battle of La Hague on the 24th May 1692, whilst £ 37,000 was distributed amongst the sailors. Medals

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\* Sir Richard Bulstrode in his memoirs says, "he wore it by a green ribbon across his shoulder until his dying day."

were struck to commemorate the victories of Marlborough ; and a gold medal bearing the head of the Duke of Cumberland in honour of Culloden. It does not, however, appear that any of these medals were worn by the recipients. Nearly fifty years elapsed before another medal was granted for war services, when a gold medal was given to each of the flag-officers who took part in Lord Howe's action of the 1st June 1794.

The next medal that was conferred by the sovereign, was for the battle of Maida, fought on the 4th July 1806. This was of gold, and was only given to the general and field officers present in that action. Medals were also struck for the more important victories gained in the Peninsula, and also for the conquest of Java in 1811 ; as in the case of those for the battle of Maida, they were of gold and were only conferred upon the senior officers.

On the 7th October 1813 the following General Order was issued from the Horse Guards :

“Considerable inconvenience having been found to attend the increased number of medals that have been issued in commemoration of the brilliant and distinguished events in which the success of His Majesty's arms received the Royal approbation, the Prince Regent has been pleased to command, in the name and on the behalf of His Majesty, that the following Regulations shall be adopted for the grant and circulation of such marks of distinction, *viz* :—

I.—That one medal only shall be borne by each officer recommended for such distinction.

II.—That for the 2nd and 3rd events, which may be subsequently commemorated in like manner, each individual recommended to bear the distinction shall carry a gold clasp attached to the Ribbon, to which the medal is suspended, and inscribed with the name of the battle or siege, to which it relates.

III.—That upon a claim being admitted to a *Fourth* mark of distinction, a Cross shall be borne by each officer with the names of the four Battles or Sieges, respectively inscribed thereupon, and to be worn in substitution of the distinctions previously granted to such individuals.

IV.—That upon each occasion of a similar nature that may occur subsequently to the grant of a Cross, the clasp shall again be issued to those who have a claim to the additional distinction, to be borne on the Ribbon to which the Cross is suspended, in the same manner as described in para II.”

To commemorate the war in Mysore, ending with the capture of Seringapatam in May 1799, a medal was struck by the Hon'ble East India Company, with the concurrence of His Majesty's Ministers. It was made of various metals, from gold for the King, Governor-General, Commander-in-Chief and various high dignitaries, both European and Native, to pure grain tin for the privates. This was the first occasion

on which the East India Company gave a medal to European and native troops of all grades engaged in a campaign. The medal will be described in its proper place.

Two perfectly different medals were given for the conquest of Java. One, by order of His Royal Highness the Prince Regent, which was conferred upon the senior officers of the King's and the Hon'ble East India Company's troops, and the other by the East India Company on the native troops. The latter medal will be described later on. The former was of two sizes, the larger of which was issued to General Officers and Brigadiers, and was worn suspended round the neck by a ribbon of the colour of the sash, *i. e.*, dark crimson with a blue edge; the smaller was given to Commanding Officers of Corps, not being of rank inferior to Lieutenant-Colonel, and to the Chiefs of military departments ranking as Lieutenant-Colonels, and was worn attached to the button hole by a ribbon of the same description as that worn by General Officers. It is to be observed that the grant of this medal to the senior officers of the Hon'ble East India Company's Forces, is the first instance of a medal for military service having been bestowed by the sovereign on any Officer of the late East India Company's army.

At this time the officers of the East India Company's armies had no military status in Great Britain, and amongst other grievances under which they laboured, was the fact that they were not permitted to wear their medals at home on public occasions, such as being presented at Court. In August 1815, the Court of Directors represented to His Majesty's Government the mortification felt by their officers at not being allowed to appear before their sovereign decorated with the honorable badges of their service and glory. This representation was promptly taken into consideration, and on the 29th of the same month, it was notified that His Royal Highness, the Prince Regent, had been pleased to permit the officers of the East India Company's armies to wear their medals and decorations in any part of His Majesty's dominions.

Waterloo was the first battle for which medals of one uniform kind were given to all engaged, and this plan was adopted on the first occasion after Waterloo, *viz.*, for the storming of Ghuznee in 1839, when medals were granted by the Indian Government to all who were engaged, whether *European* or *Native*, and the same system has been followed on all subsequent occasions when medals have been bestowed.

During the seven years commencing with the storming of Ghuznee and ending with the occupation of Lahore in February 1846, many medals had been won for services performed in India, *viz.*, for the Afghan, Sind, Gwalior and Sutlej campaigns. Her Majesty, moreover, had been pleased to give permission for her troops who had been engaged in these services, to accept and wear the medals so liberally granted by the East India Company. The old officers and men who had taken part in the campaigns in the Peninsula and America, and who, in spite of many an appeal, were still undecorated, were not a little mortified at seeing their younger brethren in arms returning from the East with their breasts covered with medals.

These appeals were again renewed, and at last, on the 1st June 1847, mainly owing to the exertions of the late Duke of Richmond, a war medal was instituted to be given to all engaged in the services of Her Majesty's fleets and armies in the wars commencing in 1793 and ending in 1814. By the terms of the General Order, medals were to be given to the surviving officers and men who had been present in the following battles or sieges:—Maida, 4th July 1806; Roleia, 17th August 1808; Vimiera, 21st August 1808; Sahagun, Benevente, December and January 1808-1809; Corunna, 16th January 1809; Martinique, February 1809; Talavera, 27th and 28th July 1809; Guadaloupe, January and February 1810; Busaco, 27th September 1810; Barossa, 5th March 1811; Java, August and September 1811; Fuentes d'Onor, 5th May 1811; Albuhera, 16th May 1811; Ciudad Rodrigo, January 1812; Badajoz, 17th March and 16th April 1812; Salamanca, 22nd July 1812; Fort Detroit, America, August 1812; Vittoria, 21st June 1813; Pyrenees, 28th July to 2nd August 1813; St. Sebastian, August and September 1813; Chateauguay, America, 20th October 1813; Nivelle, 10th November 1813; Nive, 9th and 13th December 1813; Orthes, 27th February 1814; and Toulouse, 10th April 1814.

The War medal has, on the obverse, the head of the Queen, with the date 1848; and on the reverse, Her Majesty, as the representative of her people, is in the act of crowning with a laurel wreath the Duke of Wellington, in a kneeling attitude, as emblematic of the army; in the epergne is engraved 1793-1814. The inscription on the medal is "TO THE BRITISH ARMY."

By a General Order, dated 12th February 1850, the War medal was bestowed on the survivors of the Egyptian campaign of 1801, and this, therefore, was the first military service for which it was granted. The year 1793, which is engraved on the medal given to the army, as well as that given to the navy, refers to the commencement of the great war with France—a war which was waged almost unceasingly from its declaration by the French Convention, on the 1st February 1793, until the defeat of Napoleon at Waterloo. A medal was given to every one engaged in any of the actions previously detailed, together with a clasp for each particular action in which the recipient had taken part.

It will have been noticed that, from the battle of Dunbar fought in 1650 until the capture of Seringapatam in 1799, and again from Seringapatam until Waterloo, medals had not been given to the private soldiers of the British army. The rank and file of the native armies of the East India Company had, however, been more fortunate. Thirty years before Waterloo, Warren Hastings, whom, according to the high authority of Lord Macaulay, "no ruler has ever surpassed in the great art of inspiring large masses of human beings with confidence and attachment," had bestowed medals upon the native officers, non-commissioned officers and privates of the Bengal army who had rendered important services to the State in Western India, and in the Carnatic.

The successors of Warren Hastings in the Government of India continued the custom of rewarding military service by the grant of

medals. Their bestowal, however, with the exception of those for Seringapatam, was exclusively confined to the native soldiery of the East India Company. The reasons for confining the gift of medals to the native ranks were most probably as follows:—First, it was an economical and at the same time a highly appreciated honor, and as the sepoys were constantly being called upon either to serve across the sea, or at places far distant from their homes, it was necessary to keep them cheerful and contented with the service. Moreover, on the two first occasions of these rewards being granted, the forces to which they were given were solely composed of native troops. Secondly, it was not at this time the custom to confer medals on the rank and file of His Majesty's regiments for services performed in other parts of the globe, neither could the authorities in India give medals to men of His Majesty's service without the previous sanction of the Crown, a sanction which would most likely have been refused, as creating an invidious distinction between His Majesty's troops serving in India and those serving in other countries; and a still more invidious distinction would have been made if medals had been given to the European soldiers of the East India Company and not to the men of His Majesty's regiments serving in India. Hence, with the exception of the medal for Seringapatam in 1799, no medal was given to an European private soldier for services performed in the East until the grant of the medal for the storming of Ghuznee in 1839, Her Majesty having graciously permitted her troops who took part in that achievement, to accept and wear the medal struck in commemoration of the same.\*

It may also be here noticed that the medal for Ghuznee was the first issued in India with a ribbon. It is said that when the medal for Seringapatam was issued, the recipients were given to understand that it was to be worn suspended by a ribbon of a deep yellow colour, about an inch in width†; but certainly no ribbon was issued to the Native soldiers, who, until they received the medal for Ghuznee, wore their medals suspended round their necks by a piece of silken cord.‡

The Sutlej campaign of 1845-46, was the first campaign for which clasps were conferred on all ranks, and they were given in the following manner:—A medal was given for the *first action* in which the recipient had been engaged, and a clasp was given for each of the succeeding actions at which he might have been present. Thus, if he had been at "MOODKEE," "FEROZESHAH," "ALI WAL," and "SOBRAON," he received a medal bearing the word "MOODKEE," and a clasp for each of the other

\* The circumstances under which this medal was given will be related further on.

† Carter's Medals of the British Army. Vol III p. 6.

‡ See an Article on the subject of Medals, signed A. Christino, in the East India United Service Journal for 1837. In this article, after mentioning the medals at that time to be met with in native regiments, he says.—"There is no rule, or regulation, that I am aware of, in existence, laying down, as in His Majesty's service, the way in which medals should be worn by our native soldiery. They generally wear them suspended round the neck by a string of common thread, and as they seldom take any care of them, wearing them on all occasions, they soon get so rubbed down by constant friction as to render the impressions on many of them barely discernable."

three actions. This rule was departed from when medals were granted for the Punjab campaign of 1848-49. On this occasion a medal was given for the *campaign*, and clasps for "CHILLIANWALLAH," "GOOJERAT" and "MOOLTAN." And this plan of giving a medal for the campaign, and clasps for the more important actions, has been followed on all subsequent occasions when medals have been bestowed.

Following the grant of the War medal to the British Army in 1847, a General Order was published in 1851, stating that Her Majesty had been pleased to assent to a medal being granted, at the charge of the East India Company, to the surviving officers and men of the Crown and the Company who had been engaged in the following services :—Storming of Alighur, 4th September 1803; Battle of Delhi, 11th September 1803; Battle of Assaye, 23rd September 1803; Siege of Asseerghur, 21st October 1803; Battle of Laswarrie, 1st November 1803; Battle of Argaum, 29th November 1803; Siege and storm of Gawilghur, 15th December 1803; Defence of Delhi, October 1804; Battle of Deig, 13th November 1804; Capture of Deig, 23rd December 1804; War in Nepaul, 1816; Battle of Kirkee, and Battle and capture of Poona, November 1817; Battle of Seetabuldie, and capture of Nagpore, November and December 1817; Battle of Mehidpore, 21st December 1817; Battle of Korygaum, 1st January 1818; War in Ava, 1824 to 1826; Siege and storm of Bhurtpore, January 1826.

It was directed that the medal should be called the "India medal"; it was to be given to every individual engaged in any of the actions above detailed, together with a bar, or bars, indicating the particular service or services for which it was granted. To those engaged in the battle of Kirkee, or battle and capture of Poona, a distinctive bar was to be given having the name Kirkee or Poona inscribed on it, as the case might be; to those engaged in both, a bar was to be granted having both names engraved upon it. The same course was to be pursued with the distinction granted for Seetabuldie and Nagpore. The native troops, having already received medals for the Nepaul war and for the war in Ava, were not to receive the India medal for those services. This medal is now known as the "India medal of 1851," to distinguish it from the "India medal of 1854" which was first given for the Burmese war of 1852.

There are one or two points relative to medals granted for service in India, which it will be convenient to notice in this place. For instance, a native soldier cannot be deprived of his medals by the award of a court martial. In 1820, the Commander-in-Chief in India directed that when a native soldier was dismissed in consequence of having committed theft, the commanding officer of his corps was to forward any medal he might have obtained to the Adjutant General, paying to the owner the money value of the medal. This order was either soon cancelled, or allowed to fall into abeyance, and the only reference to medals in the Indian Articles of War is in Article 47, under which any one subject to these articles can be tried for selling, pawning, destroying



or defacing any medal or decoration granted to him for service in the field, or for general good conduct.\*

Again, owing either to the presence of the Governor General himself in the field, or to his being close to the scene of action, the welcome intelligence that medals would be granted, has, on several occasions, been announced to the troops within a very few days after the action for which they were bestowed had been fought. Thus, the battles of Maharajpore and Punniar were fought on the 29th December 1843 and on the 5th of the following month an order was issued stating that a bronze star would be given to all engaged. Moodkee was fought on the 18th, and Ferozeshah on the 22nd December 1845, and on Christmas day it was announced that a medal would be given for the campaign.

Although not bestowed for service performed in India, it may not be out of place here to observe that there is one instance of an Investiture in India of the Most Noble Order of the Garter. In September 1786, Lord Cornwallis landed in India as Governor General, and shortly after received information that the King had been pleased to confer the above distinguished honour upon him. In the following March the insignia of the Order arrived in Calcutta. His Lordship was authorized to make his own choice of the persons to perform the ceremony of Investiture, and selected the Hon'ble Charles Stuart and Mr. John Shore, afterwards Lord Teignmouth, both members of the Supreme Council. The Investiture took place at Government House, Calcutta, on the 8th March 1787; Mr. Stuart investing his Lordship with the Ribbon and Mr. Shore with the Garter, when a salute of 21 guns was fired from the fort.

Instances not unfrequently occur of decorations being bestowed on non-official subjects of the British Government in India, by the sovereigns of various European States. These decorations are usually given to those thus honoured, by the consul, or other representative of the Government conferring the honour, and the recipient is not allowed to wear the same without the sanction of his own Government. The following instance is one of the few on record, of a high British official in India, presenting to a British subject a decoration conferred by a sovereign other than that of Great Britain. In 1806, His Royal Highness the Prince Regent of Portugal, having, by a special letter addressed by His Highness' Secretary of State to His Excellency the Governor and Captain General of Goa, been pleased to confer on Miguel de Lima DeSouza Esq., of Bombay, the Honor and

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\* The above was written before the present edition of the Regulations and Orders for the Army of the Bengal Presidency were published. Paras 27, 28 and 29, Sec. 21, of these Regulations all refer to the forfeiture of medals and the disposal of forfeited medals. Thus, medals granted for service in the field, are to be withdrawn from native soldiers who may be sentenced to penal servitude, or ordered to be discharged with ignominy; a native soldier thus sentenced not only forfeits the medals actually in possession, but also any which may remain unissued to him. If discharged simply by sentence of a Court Martial, or by order of the military authorities, a native soldier retains his medals, and is eligible to receive any other medals earned by, though not issued to him, at the time of dismissal.

Distinction of the Order of Christ, His Excellency the Governor General and Captain General of Goa thereupon requested and commissioned the Honorable Jonathan Duncan, Governor of Bombay, to invest Mr. De Souza with the same. The Investiture accordingly took place at Government house, Bombay, on the 6th March 1808, in the presence of the members of the Government of Bombay, and of the principal gentlemen of the place. At the moment of Investiture, a royal salute was fired from the saluting battery, and after the ceremony was concluded the ladies and gentlemen who were present partook of a collation.

It has been customary, from the earliest period of our connection with India, to reward those who may have distinguished themselves in our service, by presenting them either with dresses of honor, swords of honor, gold chains, bracelets, or some other visible mark of distinction. It does not, however, fall within the scope of this article to attempt to give any detailed information as to the various occasions on which these honours have been conferred.

The posthumous honors bestowed on Commandant Syud Ibrahim are, however, exceptional, and a brief account may prove interesting. Syud Ibrahim was the Commandant of the Tanjore cavalry with Colonel Baillie's detachment, when it was defeated at Perambaucum, on the 10th of September 1780, by Hyder Ali. Syud Ibrahim was taken prisoner and confined at Seringapatam in the same quarters as the European officers who had been made prisoners on that occasion. By the fortitude with which he bore his own sufferings, as well as by his efforts to mitigate those of his European fellow prisoners, he became the theme of their prison songs, and the object of their veneration. Hyder made many fruitless attempts to induce him to enter his service, and, at last, ordered him to be removed to Cowley Droog, where he was subjected to the hardships of rigorous confinement and unwholesome food, in hopes that he would be forced into accepting the Sultan's offers. Before leaving Seringapatam, he begged of the European officers that, in the event of their release, they would endeavour to obtain some provision for his family. The officers were set free in March 1784, but Syud Ibrahim remained in confinement, and some years elapsed after their release before accumulated sufferings brought him to the grave.

After the capture of Seringapatam by Lord Harris in 1799, enquiries were made as to the fate of Syud Ibrahim, and search was made for his family. On the 26th May 1800, a General Order was issued by the Government of Fort St. George, in which Lord Clive, the Governor, after giving a brief history of the Commandant, proceeded as follows:—

“His Lordship, therefore, experiences the most cordial gratification in pointing out to the native troops of this establishment, the memorable example of attachment and fortitude exhibited by Syud Ibrahim, in resisting the earnest solicitations, in supporting the oppressive cruelty of the late Sultan, and in finally *laying down his life as a sacrifice to the duties of fidelity and honour.*”

"In order to manifest his respect for the long services, the exemplary virtues, and the impregnable fidelity of Syud Ibrahim, the Governor General in Council is pleased to order and direct, that the amount of *his pay* as Commandant of Cavalry, being fifty-two Pagodas and twenty-one Fanams per month, shall be conferred for life on his sister, who left her home in the Carnatic to share his misfortunes in captivity, and who was subsequently wounded in the storm of Seringapatam."

"In order also to perpetuate His Lordship's sense of Syud Ibrahim's truth and attachment to the Company's service, the Governor in Council has ordered a tomb to be erected to his memory at Cowley Droog, with an establishment of two lamps and a Fakir, for the service of the tomb according to the rites of his religion."

The gift of a palanquin, with a monthly allowance to maintain it in adequate style, was, at the commencement of the present century, a not uncommon way of rewarding native officers for long service and fidelity.

I will now proceed to give an account of the Medals and Decorations which more properly fall within the scope of this article.

#### DEFENCE OF THE FACTORY AT SURAT.

*January 1664.*

On the 5th January 1664, Sivaji, the Mahratta chief, after having ravaged the neighbourhood, entered the city of Surat. The native Governor shut himself up in the castle, on the walls of which had been mounted some guns obtained from the wreck of the English ship "Middleburgh," and permitted the Mahrattas to plunder at their convenience. The English and the Dutch Factors, however, showed a bold front, and so gallant were the efforts of Sir George Oxinden, the President and Chief Director of the English Factory, and his subordinates, that they not only held their own, but were able to save the property of many natives. So highly did the Emperor Aurangzeb appreciate their gallantry, that he sent Sir George Oxinden a dress of honor, and granted the Factory an exemption from a portion of the custom duties.

The Directors of the East India Company showed their approval of the President's conduct by presenting him with a gold medal, bearing the motto "NON MINOR EST VIRTUS, QUAM QUERERE, PARTA TUERI," together with a gratuity of £200 for himself and £400 to be distributed among the Council and subordinate servants.\*

#### SCARVES GIVEN TO LIEUTENANT RICHARDSON AND THREE OTHER OFFICERS.

*December 1680.*

In 1680, the English at Fort St. George became embroiled with Lingapa, the Naick of Poonamalee, who collected the rents of that district for the King of Golconda. In view to extorting money from

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\* Bruce's Annals of the Hon'ble East India Company, Vol. II, p. 203.

the English, he subjected them to many annoyances, and, at last, sent one of his officials to Madras, attended by peons with drums beating and carrying a flag as a Havildar. This man stated that he had been appointed Governor of the place by the King of Golconda. Mr. Streynsham Master, Governor of Madras, had him at once arrested and turned out of the town. Lingapa now demanded that 2,000 pagodas should be paid as the rental for the town instead of 1,200 as originally agreed upon. In order to force the English to accede to this, he prohibited provisions and articles of merchandise being sent to Madras. Whenever hard pressed, however, Mr. Master sent out armed parties and forcibly brought into the fort whatever might be required. In December 1680, Lieutenant Richardson set out for Poonamallee at the head of 400 peons and 12 files of the soldiers of the garrison, and succeeded in bringing back a large quantity of property belonging to the Factory. For this service, a silk scarf was given to each of the four officers, a hogshead of arrack was given to the soldiers of the garrison, the chief peon got two and a quarter yards of broad cloth, and five pagodas were distributed amongst the peons to enable them to have a feast.

#### CAPTAIN JOHN ROACH.

1711—1717.

Surroop Sigh, Raja of Gingee, having laid claim to the rent of Fort St. David and the adjacent villages, not only was his claim admitted, but Mr. Roberts, the Deputy Governor, became security for the men to whom the collection of the rents had been farmed by the Raja. Shortly afterwards the men absconded, carrying off the money they had collected. Upon this the Raja demanded payment of the rents from the English, and in order to obtain a prompt settlement of his claim, seized two European officers of the garrison, and sent them to Gingee, giving out that they should not be released until his demands had been satisfied. In retaliation, the Government of Fort St. David, in February 1711, attempted to seize two officials of the Raja's who happened to be in the neighbourhood; in this they were not successful, and a fight ensued, in which three of the Raja's people and one of the English were killed. On news of this occurrence reaching Madras, Mr. Raworth, a member of the Council, was ordered to proceed to Fort St. David with five ships, at the sight of which force it was hoped that the Raja would come to terms. Mr. Raworth and the ships, however, did not arrive until July, and in the meanwhile the troops of the Raja had so effectually blockaded the fort, that the only supplies the garrison could obtain were such as reached them by sea.

During the night of the 10th August 1711, the enemy for a short time occupied some walled enclosures within the Company's bounds, and from the cover they afforded, opened fire upon the garrison. Captain John Roach was, therefore, ordered to level these walls and started at daylight the following morning, taking with him some of the

European soldiers of the garrison, 200 peons and a party of coolies. Captain Roach's account of the action which ensued is as follows.\*

"The coolies began to work about the demolishing the walls by six in the morning, and continued till 12 at noon; but could not hear of any of the enemy's to be near our bounds, only a few peons about a mile off. But about 12 o'clock, intelligence was brought that Mahobat Khan, with all the force of Ginjee, was within a mile of our bounds. Upon which I despatched immediately a peon to the Governor and Council, who was not arrived in two hours. In the interim, before I had any relief from the rest of the bounds, they attacked me with about 400 horse and 1,000 foot. It was a great misfortune to me their attacking the party Captain Coventry had the command of, and Ensign Somerville; the latter proved such a coward, that he was the occasion of the ruin of the whole party, in shewing them an example by running away first, which cost him his life, and abundance more of the same party. But I must do Captain Coventry that justice, that he behaved himself extraordinarily well, and would have made a very good officer, if please God he had lived. He received several wounds before he dropped. I had my horse shot under me, and was charged several times by the whole party of horse upon both flanks and rear, and kept them in play till they were glad to leave me master of the field with less than forty men. There was not one of the 200 peons I carried with me, would stand, neither officers nor peons; but when the horse charged me they presently ran away. If they had but stood by me, I would have mounted as many horses of the enemies as would have made a good troop for the Company. For there was not less than seventy or eighty of them running about the field, without riders, their masters being dismounted. We compute that the enemy could have lost not less than 140 and 150 men, killed and wounded, besides horses. I have buried the dead all in the field of battle, excepting Captain Coventry and Ensign Somerville, whom I sent to the fort. I leave any impartial person to judge what the loss of the enemy must be, when they were at the push of the pike for two hours together, and applied with our bullets and swan shot as fast as possibly we could. This is the true narrative of what happened."

Shortly after this action, it was reported to Mr. Farmer, the Deputy Governor, that Mohubut Khan had boasted that the English dared not quit their bounds and march into the territory of the Raja. Immediately on hearing this, Mr. Farmer ordered out a detachment from the fort, which destroyed several of the Raja's villages, and grain to the value of about 6,000 pagodas. This still further incensed the Raja, so that, on Mr. Raworth entering into negotiations for peace, he demanded a money payment of 16,600 pagodas, but, at the same time, offered to forego for the future his somewhat doubtful claim to rent for Fort St. David. These terms were referred to Madras, where they were carefully considered by the Council. Some of the Members were in favour of accepting the terms, arguing that the monthly cost of the war was 4,000 pagodas,

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\* Madras in the Olden Time, by J. Talboys Wheeler, Vol. II. p. 154.

that while it lasted the trade of Fort St. David was at a stand still, and that, under no circumstances, could the English ever hope to recover even the smallest portion of the cost of the war. Finally, however, it was decided that the sum of 16,600 pagodas was too unreasonable a demand, but that Suroop Singh was entitled to the amount carried off by the contractors, for whom Mr. Roberts had stood security, and the Council, in their instructions to Mr. Raworth wrote — "We shall apply the money we have attached, belonging to Mr. Roberts, for the payment of this matter, as far as it will go, and shall take care to debit him for the remainder." The Raja declining to accept a sum less than he had demanded, the negotiations were broken off.

It having been ascertained that 300 of the Raja's troops occupied an intrenched position at Crimmbaukum, half way between Pondicherry and Fort St. David, and that a patrol was sent every night in the direction of the latter place, Mr. Raworth determined to try and cut it off. On the evening of the 19th August 1712, Captains Courtney and Howson with 60 grenadiers, were ordered to carry out this plan, and at 9 P.M., were placed in ambush at a suitable spot. Here they remained until 1 A.M., when not seeing any sign of the patrols, it was determined to march on to the enemy's intrenchment, on arriving at which, they found about forty of the Raja's people outside; these hurried to get into the intrenchment, but the gate was closed before twenty two of their number had succeeded in this object, and they were all killed by the grenadiers.

Sergeant Aulin, with two files of grenadiers, was now ordered to mount the wall on the opposite side of the intrenchment, and to drive the enemy towards the side where the two Captains and the main body were posted. This plan was successfully carried out, and on the enemy coming sufficiently close, forty grenades were thrown amongst them, which did great execution, the sergeant and the men with him firing swan shot into the crowd all the while. The gate was now burst open, and the grenadiers rushed into the intrenchment, sword in hand; the enemy at first made a stout resistance, but at last broke, and escaping over the walls left the English in possession of the place. The loss of the enemy in this affair is stated to have been one hundred killed, that of the English is not given.

This little war continued to drag on until April 1712, when peace was concluded through the mediation of the Governor of Pondicherry. The English paying 12,000 pagodas to Suroop Sing, and making good the losses sustained by some others. It is noteworthy that at this time the English and the French were at war in Europe, and on this account the Council at Madras hesitated for some time to avail themselves of the services of the French, but the heavy cost of a useless contest at last induced them to pocket their pride and accept the proffered mediation.

Five years elapsed before the English again came into collision with any of the native chiefs in the neighbourhood of their settlements.

On the 24th July 1717, the Imperial Firman, which had been obtained from the Emperor Ferokshere, by the mission from Bengal, of

which Mr. Surman was the head—but whose success was mainly due to the emperor's gratitude for the skill with which he had been treated for a troublesome disease by Mr. Hamilton, the doctor of the mission—was publicly read at Madras. Amongst the privileges therein accorded to the English, and the one which most directly affected the settlement of Fort St. George, was the grant of Trivatore, and four other villages. The Nawab of the Carnatic, however, demurring to make over the villages, Mr. Collet, the Governor, wrote to him on the 2nd September, expressing his determination of taking possession of the villages within twenty-one days. In order to propitiate the Nawab, the letter was accompanied by a sum of 500 pagodas, which it was requested might be considered as his, Mr. Collet's present, on succeeding to the Governorship of Fort St. George. At the same time a present of 200 pagodas and some cordial waters were sent to the Nawab's son-in-law and Secretary.

In fulfilment of his promise, Mr. Collet set out early on the morning of the 23rd September for Trivatore, of which place he at once took possession, and having dined there, returned to Madras the same evening. Two other villages were taken possession of the same day, and the remaining two, on the following day. On the 29th, intelligence was received that the Nawab had refused to receive the 500 pagodas. It was therefore decided to double the amount of the present. On the 9th October, however, a letter was received from Diaram, the renter of the villages, demanding upon what authority the English had taken possession of the same, and adding, that unless a sunnud from the Nawab had been obtained, the villages must be restored to him. In reply, Diaram was informed that the villages had been bestowed upon the English by the Emperor, and that they would not be given up. On the 18th, Diaram's son entered Trivatore with 250 horse and 1,000 foot, cut down the English flag-staff, and took possession of the place. On the same day, a Brahmin, in the employ of Diaram, sought an interview with Mr. Collet, and demanded a present of 1000 pagodas for his master, in return for which he would renounce all claim to Trivatore and the other villages, and stated that if his demand was not granted, Diaram would occupy the remaining villages the next day. Mr. Collet at once assembled the Council and it was determined that for the following reasons an attempt should be made to drive Diaram's people out of Trivatore. First,—that Diaram had no pretence to make any demands on the English for the town, the Firman from the Emperor directing the English to demand possession of the same from the Nawab; Secondly,—that to sit down quietly without resenting the affront would encourage the enemy; and thirdly,—“our men having of late been pretty well disciplined, and being now completely officered, we do not doubt their being able to drive the enemy out of the town and maintain the possession, which we hope will have so good an effect as to deter them from attacking us rashly again”; and finally,—the Council agreed that the direction of the proposed military operation should be exclusively left in the hands of the Governor.

Mr. Collet having held a consultation with the military officers, decided that Lieutenant John Roach should march with 150 of the garrison

at 2 A.M. on the following day, the 19th, towards Trivatore, and that he should endeavour to enter the town about day-break, and that, if he found the enemy still there, he was to attack them, and drive them out of the place, of which he was to keep possession until further orders. Lieutenant Roach marched, as directed, and at 9 A.M. Mr. Collet received a report from him stating that he had entered the town exactly at the time determined upon, and had found the enemy in possession; but that, in the course of an hour, he had driven them out into the plain. That after this, they had attacked him several times, but had been repulsed; on his pursuing them into the plain, however, he had seen a fresh body of about 500 horse coming from the northward. On receiving this report, Mr. Collet ordered Lieutenant Fullerton with 100 more men of the garrison and two field pieces to join Lieutenant Roach. He, moreover, called out the militia and entrusted the defence of the White town to them, whilst the advanced posts were held by the remainder of the garrison; and Gunner Hugonin, with the Governor's horse guards, six in number, was directed to patrol the washerman's quarter to prevent the enemy plundering in that direction.

At 3 P.M. Mr. Collet received a second communication from Lieutenant Roach, written half an hour after noon; in this he stated that the enemy had skirmished with him until close up to that time, but had drawn off to some distance; that he had recovered the flagstaff and flag which he had again hoisted. Soon after intelligence was brought that Lieutenant Fullerton had joined Lieutenant Roach, and that the enemy were in full retreat. Mr. Collet now ordered Lieutenants Roach and Fullerton to march back, either that evening or the next morning, "it being difficult to supply them with necessaries at that distance." On receiving these orders the troops commenced their return march and arrived at Fort St. George about 8 o'clock.

Although the enemy's fire had been kept up for about six hours, not a man of Lieutenant Roach's detachment was either killed or wounded by their fire. One of the European soldiers, however, was shot in the arm, "by his comrade's error in firing". The enemy left five of their number dead on the plain, their wounded numbered about thirteen, Diaram's eldest son being of the number.

Mr. Collet, in his report to the Council, spoke highly of the skill and good conduct of Lieutenant Roach, "who had posted his men in such a manner that the enemy was not able to make any attack without certain loss to themselves, at the same time they were unable to do us the least injury". He, therefore, proposed to the Council "to consider of some honorary reward to be given to Lieutenant Roach, who, to his former merit at Fort St. David, had added this new and eminent service." In consequence of this report the Council passed the following resolution:

"Agreed, that in consideration of Lieutenant John Roach's former service at Fort St. David, for which the Hon'ble Company have in their letters ordered him a gratuity, which has never yet been given, and also in consideration of his eminent service at Trivatore on the 19th instant, in defeating the enemy, with so much loss on their side, and without the loss of one man on ours that the President by his Commission



constituted Lieutenant John Roach, Major of all the Hon'ble Company's forces on the Coast of Coromandel and Island of Sumatra; and that a Gold Medal, with the Hon'ble Company's arms, set round with diamond sparks, with an inscription on the reverse, suitable to the occasion, (the value about 300 pagodas) be given him.

"Agreed that his pay as Major be 20 pagodas per mensem."

"Agreed that it be left to the discretion of the President to order some smart money to the wounded, and some gratuity to the inferior officers, who all behaved themselves very well in the engagement."\*

**GOLD MEDAL AND CHAIN PRESENTED TO MEER MUNSOOR, A SUBADAR OF SEPOYS, 15TH NOVEMBER 1753.**

The following is an extract from Government Consultations, Fort St. George, 5th November 1753.†—

"Meer Munsoor, a Subadar of Sepoys, having on many occasions behaved with remarkable bravery, and received many desperate wounds without ever having had any particular reward, it is agreed that he be presented with a gold chain and medal, with the Company's arms on one side, and this legend:—"The gift of the Honorable United East India Company," and on the reverse, his own effigies with a drawn sword in his hand."

(Signed) THOS. SAUNDERS, AND COUNCIL.

**GOLD MEDAL PRESENTED TO MAHOMED YUSUFF KHAN, BAHADOOR, COMMANDANT OF ALL THE SEPOYS IN THE COMPANY'S SERVICE, 1755.**

Extract from a letter to Government from Major Lawrence dated Camp, 8th March 1754.‡

"I beg leave to recommend another person to you, Gentlemen, for your notice; 'tis our Commander of Sepoys by name Mahomed Issoof.§ Besides his intelligence and capacity, I cannot too much praise his zeal and alacrity for the service. He always prevents my asking, by offering himself for everything, and executes what he goes about as well and as briskly as he attempts it. Some mark of your regard by a

\* Madras in the Olden Time. By J. Talboys Wheeler, Vol. II. p. 289.

† See p. 73 Vol. I. of History of the Madras Army, compiled by Lieut.-Colonel W. J. Wilson, Retired List, Madras Army.

‡ See page 74 and p. 183 Vol. I. of History of the Madras Army, by Colonel W. J. Wilson, Retired List, Madras Army.

§ This officer rebelled in 1763, when employed in the management of the Madura and Tinnivelly districts. Nearly the whole [of the available force in the Madras Presidency was employed in the reduction of Madura, where he had hoisted the French flag. He attacked two of the British reconnoitring parties and inflicted a heavy loss; and when the fort was assaulted, he beat back his assailants, who had two officers killed and eight wounded, one hundred and twenty British, and fifty Native non-commissioned officers and men killed and wounded. After this repulse the siege was converted into a blockade, which was so strictly maintained for some months, that great scarcity and discontent ensued, which resulted in the formation of a party against Mahomed Yusuff, and he was seized and confined by Monsieur Marchand, Commanding the detachment of French he had enlisted. The place was then surrendered, and Mahomed Yusuff was hanged. The whole history of this man's career is most interesting and instructive.

letter, and some little present, would keep up that useful spirit, besides rewarding merit."

Upon this recommendation the Government of Fort St. George directed that a commission should be granted to Mahomed Yusuff, appointing him Commandant of all the sepoys in the Company's service, and that he should be presented with a medal. Accordingly, early in the following year, he was presented with a gold medal in acknowledgment of his services. This medal had the Company's arms and motto, on one side, and the following inscription on the other:—

"To Mahomed Isouf Cawn Bahauder, Commander of the Honorable English Company's Sepoys, this medal is given by the Honorable the Governor and Council of Fort Saint George as a reward to courage, and to preserve to posterity the name of a brave soldier, a skilful officer, and a faithful servant."

#### GOLD MEDAL PRESENTED TO CAPTAIN ANDREW BUCHANAN—CAPTURE OF GHERIA, FEBRUARY 1756.

On the 7th February 1756, Admiral Watson sailed from Bombay with four ships of the line, one of 44 guns, three of 20, and a grab of 12, together with five bomb ketches, in all fourteen vessels, having on board a body of troops under Colonel Robert Clive, numbering 700 Europeans, 300 Topases and 300 Sepoys. The object of this expedition was the reduction, in conjunction with a Mahratta fleet and army, of Gheria, the stronghold of the pirate Angria. The English fleet arrived before Gheria on the 11th. Here they found the Mahratta fleet consisting of from four to five grabs and from forty to fifty gallivats. The Mahratta army, estimated at 6000 horse and about the same number of foot, under command of Ramajee Punt had already invested the place.

Immediately on his arrival, the Admiral summoned the fort to surrender, and received for answer,—“that the garrison were well apprized of the force he had brought with him, but if, agreeable to the summons he had sent, he was resolved to be master of the fort, he must take it by force, for they were resolved to defend it to the last extremity.”

Early the next morning some of Angria's relations, accompanied by several officers of the Mahratta army, went on board the Admiral's ship, in order, as they said, to see the fleet, but in reality to ascertain the Admiral's intentions. They were allowed to go over the ship, and were then informed, that if the fort were delivered up peaceably before hostilities commenced, Angria and his family might depend upon the Admiral's protection. They then begged that the fleet might remain where it then was, promising to return in a few days with an answer. To this the Admiral replied, that he would sail into the harbour that very day as soon as the sea breeze would permit, adding, however, that unless the fort fired first on his ships *while they were under sail*, he would not commence hostilities, nor before he had received an answer from Angria, but gave them to understand that he would not wait long for a reply.

In fulfilment of the Admiral's expressed determination, between one and two o'clock the fleet weighed anchor, and stood in with a light breeze for Gheria harbour. It sailed in two columns, the larger ships being so disposed as to protect the smaller vessels from the fire of the enemy. The bomb ketches were placed under the direction of Captain Tovey of His Majesty's train of Artillery. The engagement commenced at about two o'clock by the enemy firing on the leading ship, and in less than a quarter of an hour, being still under sail, the Admiral made the signal to engage. Soon after, the fleet anchored, and the engagement began with vigour. In a short time a shell set fire to the Restoration grab which had been captured by Angria from the English, and the grab driving amongst the rest of the enemy's ships, which were all lashed together, set them in flames, so that in a few hours the whole of Angria's fleet was destroyed. At about half past four, the enemy's guns having been almost all silenced, the signal to discontinue firing was made, and at the same time the ships were ordered to warp in nearer to the fort. No sooner had this been done, than the enemy renewed their fire, and the fleet was ordered to do the same; and so fierce was the fire of the English ships that by half past six the enemy's guns were silenced.

A deserter having informed Admiral Watson that Angria had given himself up to the Mahrattas, and was endeavouring to prevail upon Ramajee to accept a ransom for the fort, the troops under Clive were promptly put into boats, with orders to land to the eastward of the fort so as to get between it and the Mahrattas. By nine o'clock two signal fires on the shore showed that Clive had safely landed. The bomb ketches continued throwing shells into the fort until day-light when the line of battle ships were ordered to warp in as close as possible so that they might be ready to "batter in breach," as soon as the signal should be thrown out.

An officer was then sent with a flag of truce to the Governor with a second summons to surrender. He returned with a refusal. Upon which the ships were warped within fifty yards of the fort\* and opened fire from their lower deck guns, which were 32 pounders, and with such effect, that at two o'clock a magazine blew up, and at four o'clock, a flag was hoisted as a signal of submission. An officer was, therefore, sent to demand the immediate admission of the troops into the fort, and that the British flag should be hoisted on one of the bastions. The officer returned in an hour saying that the governor consented to hoist the British flag; that he would admit five or six men that evening, and in the morning would surrender the fort. This answer not being deemed satisfactory, the fire from the fleet was renewed, when the enemy again hoisted a flag in token of submission.

Clive now came on board the Admiral's ship, bringing with him an officer from the fort to make the necessary arrangements for the surrender. In the meanwhile the Mahratta chief had placed Angria

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\* Orme's History of the Military Transactions of the British Nation in Indostan, Vol. I, p. 415.

in confinement, and had succeeded in extorting from him an order to his brother to deliver up the fort, fully intending, if he could get possession of it in this way, to exclude the English from any share of the booty. Having succeeded in obtaining the order, Ramajee tried to get a few of his men into the fort, but owing to the manner in which the English troops were posted, failed to do so. As a last resource "he made secret overtures to Captain Andrew Buchanan, the officer on picket, offering him a bill on Bombay for eighty thousand rupees, if he would permit him and a few of his men to pass into the fort, an offer which was rejected as became a British officer; but it is a circumstance worthy of notice, as elucidating the character of the times, that the Bombay Government thought common honesty so rare, as to present Captain Buchanan\* with a gold medal in consideration of his extraordinary good behaviour."†

At sun rise on the 14th, Clive, with the troops, marched into the fort; in it were found fourteen European prisoners, ten of whom were English, the rest Dutch; two hundred and fifty guns, six mortars, and a large quantity of arms and ammunition. The treasure, which amounted to £100,000, and £20,000 which was realised by the sale of property, was at once divided amongst the officers and men of the fleet and army engaged in the capture, no portion being reserved either for the King or the East India Company. The loss of the English engaged in the reduction of this important stronghold amounted to only twenty killed and wounded. In the beginning of April the fleet returned to Bombay, and after such repairs as were necessary had been executed, sailed from thence on the 27th April, and arrived at Fort St. David on the 14th of May.‡

#### PLASSEY, 23RD JUNE 1757.

A medal, to commemorate the victory of Plassey, was struck by the Society for Promoting Arts and Commerce.§ On one side of the Medal

• He belonged to the Bombay European battalion, and subsequently commanded one of the two companies ordered to Bengal, on news of the capture of Calcutta by Suraj-ud-Daula reaching Bombay. These companies amounted together to about three hundred men, of whom, however, a third were Malabar Topasses. They arrived at Calcutta early in March 1757, and took part in the capture of Chandernagore. Captain Buchanan having died on the 5th June was succeeded in command of the company by Lieutenant Charles Palmer, who commanded it at the battle of Plassey. In September 1759, all the Europeans of the two companies were transferred to the Bengal European battalion, but Clive having determined to have no Topasses in the battalion, all the men of that class were sent back to Bombay by the first opportunity.

† Grant Duff's *History of the Mahrattas*, Vol. II, p. 91.

‡ *Ive's Voyage and Historical Narrative*, p. 89.

§ The Highland Society of London, being highly gratified with the accounts given of the gallant conduct of their countrymen in Egypt, determined to bestow on them some mark of their esteem and approbation. It was decided to commence with the 42nd as being the oldest of the Highland regiments. Medals were accordingly struck with the head of Sir Ralph Abercrombie on the reverse, and emblematic figures on the obverse. Owing, however, to the Officers of the regiment having taken offence at a communication made by the Society asking for information relative to the capture of the standard of the Invincibles, these medals were not given to the Corps. The Patriotic Fund established in London in 1803 expended between that year and 1809, the sum of £21,274.17. 2. in the purchase of pieces of plate and swords which were given to officers and others who had distinguished themselves in the war with France. These honorary rewards, however, were almost entirely given to officers of the Royal Navy or of the East India Company's ships.

Lord Clive is represented bestowing the Soubahship of Bengal on Meer Jaffier. Lord Clive is dressed in a Roman habit, and holds in his left hand a staff surmounted by a lion, while with his right he is giving to Meer Jaffier another staff, surmounted with a fish, the emblem of the Mahee. In the space between the figures are grouped together, a globe, a cornucopia and an antique rudder referring to the legend "INJURIES ATTONED, PRIVILEGES AUGMENTED, TERRITORY ACQUIRED," which surrounds the central figures. The cornucopia symbolises the riches with which Meer Jaffier atoned for the injuries done to our countrymen by his predecessor; the rudder is for the augmentation of our navigation and commercial privileges; and the globe for our territorial acquisitions; all of which were the consequences of this victory. In the exergue is written—"A Soubah given to Bengal MDCCLVIII.\* On the reverse is a figure of Victory seated on an Elephant bearing a trophy in one hand, and a palm branch in the other. The inscription is—VICTORY AT PLASSEY, CLIVE COMMANDER; in the exergue is the year MDCCLVIII. and the mark of the Society for Promoting Arts and Commerce. The medal appears to have been struck both in gold and silver, but under what rules the medals were distributed is not known. Mr. Randolph Marriott, of the Civil service, and who served in India under Lord Clive, received a gold medal for Plassey, but his name does not appear in any of the accounts now extant as having been present in that action.

#### PERMACOIL, 5 MARCH 1760.

After the surrender of Wandiwash to the English, on the 30th November 1759, Lally, the commander of the French troops in the Carnatic, prevailed upon the Killadar of Permacoil, to admit a party of French troops into his fort. They were commanded by Colonel O. Kennedy of the regiment de Lally, and consisted of 15 selected European Artillerymen, 32 Africans, and 100 Sepoys. The fort was situated on the top of a steep rock and was strongly fortified in the native fashion and mounted 20 guns, the lower portion of the rock was merely surrounded by a breast work of loose stone. Colonel Coote moved against it with a detachment consisting of the Grenadier Company of the 84th† Regiment, a Company of European Pioneers, a

\* Plassey was fought in 1757, so the year given on the Medal, must refer either to the year in which the Medal was struck, or to the year in which the Society formed the idea of giving the medal.

† This was the first regiment numbered the 84th. It was raised by order of the King, early in 1759, at the request of the Court of Directors for service in Bengal. It was formed by drafts from old Corps, and the Command was given to Captain Eyre Coote, who had served in India with the 39th Regiment, with the rank of Lieutenant Colonel Commandant. The regiment arrived at Madras, at the latter end of 1759, and its services being required on the coast, was disembarked, and Coote was appointed Commander-in-Chief of all the troops on the Madras establishment. In 1761 the regiment embarked for Bengal in two large country ships, one of which, the *Futty Islam*, foundered near the Sandheads, and nearly every soul on board perished. The regiment was completed by drafts from home. Towards the end of 1763, it was ordered to England, the officers and men being allowed to volunteer for the East India Company's service. Five lieutenants, six ensigns, and the greater portion of the men availed themselves of this permission. Shortly after its arrival in England in 1766, the regiment was disbanded.

Company of French Volunteers, composed of deserters from the French army, and eight Companies of Sepoys. After taking possession of the lower part of the rock with but little loss, he, on the 2nd March, attempted to carry the fort by escalade, but failed, chiefly owing to the shortness of the ladders. The garrison defended themselves stoutly for three days, but on the 5th March, new scaling ladders having been prepared, orders were given for another assault; but just as the troops were moving off, the garrison beat the Chamade, and surrendered at discretion. Their loss only amounted to three men, while that of the English was Ensign Blakeney and 4 European rank and file killed; Colonel Coote, his Aide-de-Camp, Captain Adams, and 15 European rank and file wounded. The Sepoys had 40 killed, including 3 native officers and 70 wounded. They were said never to have fought so well, and the gallantry of the senior Native Officer, Bulwunt Sing, was so conspicuous that he was rewarded with a Gold Medal.

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## VI.

### ARABIA

AS A SOURCE OF HORSE-SUPPLY FOR THE  
GOVERNMENT OF INDIA.

BY

LT. COLONEL W. TWEEDIE, B.S.C.

*Officiating Political Resident in Turkish Arabia.*

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“And by the keeping of horses you will make  
afraid God’s enemies, and yours.”

K u r a n.\*

#### SECTION I.

#### RETROSPECTIVE.

Seventy years ago, a Major Sloane paid a visit to Basra, and noted down in his journal (published, after his death, in the “Bengal Sporting Magazine”) many interesting particulars about the trade in horses then going on between the Persian Gulph and Bombay. The following are the chief outlines of what he wrote. The traffic had sprung up thirty years or so before his visit, say about a century ago from the present time. A Mr. Manesty, one of the East India Company’s earlier commercial factors and political Residents at Basra, had personally entered deeply into it. His influence enabled him to procure any number of horses. Captains of ships from India trading up the Persian Gulph speculated in the same way; and the Basra merchants found it profitable to collect horses from the interior, both for the purpose of supplying them and for exportation on their own account. The breeding of horses near Basra, as well as the carrying of them there for sale, from places at a considerable distance off, had thus been stimulated; and there was reason to believe that specimens of the purest blood of Najd were being sent from time to time to India. Mr. Manesty’s principal dealings were with the Muntafik tribe; a large and turbulent, but only semi-Bedouin, people, occupying both banks of the Tigris and Euphrates, within easy access of Basra; but he also bought from other sources. His plan was to purchase horses, or colts, of all ages; and sometimes even to make his bargain before the foal was dropped. Those of mature age he sent off at once to Bombay; keeping the younger ones till fit for export. During 1812, about a thousand horses left Basra for India. How many were of pure Arab blood there were no grounds for conjecturing; but it seemed probable not above a quarter of the number were high-bred horses. Of the total

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\* Owing to a want of the requisite type this quotation cannot be here given in its original Arabic.



of one thousand, about three hundred and sixty were sent as remounts for the Madras cavalry, by an Officer deputed to Basra as a purchasing agent. Forty or fifty more were bought by the same officer for friends in India; and the rest were sent, chiefly by native merchants, in Arab ships. Of the horses bought for the Madras Cavalry all, except a few of the youngest, stood fourteen one at the withers. They were not *generally* high-bred; but *some of them*, Major Sloane believed to be of the "purest and best blood of the country."

The above opens up an interesting glimpse of bygone days. In the foreground, there is the trading Consul, or Resident, trying to make hay for himself, no doubt, in the sunshine of office, but at the same time developing, or perhaps even creating, a trade advantageous both to the people of Arabia and the Government of India. That the horses thus collected and sent to Bombay rendered yeoman's service in the wars of that stormy period may be taken for granted. What the Major has said about specimens of the purest Najd blood having thus, from the very outset, found their way in tolerable numbers to Bombay, is confirmed by the performances of the heroes of the Indian Turf even in those early days; as well as by the fact of many, perhaps even the majority, of winners having then, as now, been under galloway height: from the famous "Sulky" (1812), afterwards taken to England, where he was known as the "Cole Arabian," down to "Rex" and others in training at the present time. In the interior of Najd, there is so little water that natural pasturage is scarce, and cultivation even rarer. The colt bred there has, therefore, to be content with very hard fare; and the wonder is, not that he frequently turns out small, but that he attains the muscular and symmetrical proportions he so often does. Still there are exceptional circumstances and localities even in Najd, and it is unsafe to generalise too freely as to the size and other characteristics of the horses occurring throughout such a very considerable tract of country. Large as well as small Arabs shone on the Indian Turf long ago, and no one thought of ascribing their superiority to an admixture of English blood. There was "Odds-bobs," for instance, standing fully fifteen hands high, whose day was from 1806 to 1812, and whose origin Major Sloane thought he satisfactorily traced, when at Basra, to a family of chesnuts in the possession of a neighbouring Shaikh. Another "big one" of a slightly later date was the famous "Chester;" and if the "*multum in parvos*" have, on the whole, prevailed, that may only be because excellence oftener shows itself on a small than a large scale. Even apart from special climatic conditions and their effects, it is but natural that giants, equally with dwarfs, should now and then appear among Arabian horses, as among other animals. At Bushire, Major Sloane saw a mare, imported from Arabia as a filly, upwards of fifteen hands high, for which £200 was refused. This mare, he said, was more like the well-made English blood-horse than any Arab he had ever seen before.

The ups and downs of this traffic in the first half of the present century belong now to the past. Fortunately the influx was strong during all the time that the sepoy Mutiny was at once exhausting

indigenous sources of supply in India, sweeping away many of the East India Company's stud depôts, and taxing in an extraordinary degree the powers of the cavalry and artillery branches. About 1860, the number of freshly landed Arabian horses entered every year for the great race of the Bombay turf, known as the "Dealers' Plate," averaged sixty or seventy. The prize thus came to be worth, without any betting, something like ten thousand rupees to its winner. And this sent up the prices of Arabian horses in Bombay, to figures fully accounting for the briskness of the import trade. Indeed it is worthy of note by race committees, when framing prospectuses, and especially by Governors and others when contributing special plates, that the greater the encouragement given to Arabian horses in this particular manner, the larger will be the number, and the higher the quality, of those brought over from Arabia—a remark based on the view that, of all classes of horses anywhere used for turf purposes, the Arabian, if, in point of speed, least of the racer, is incomparably most of the charger, trooper, and, in a word, saddle-horse, at all events in tropical climates and under the hardships of campaigns, now that the Cape horse of olden times has disappeared, it is said, even from the Cape, and certainly from India. Some have thought it wrong thus to raise the prices of Arabians in the Indian market; and there is, as usual, much to be said both ways. But looking at things as they stand, it is certain that it is to this India partly owes her wonderfully good supply of Arabian horses. If a list were made of all the horses entered during the last twenty years for the Calcutta Derby, for instance, which is for Arabs only, and another of those entered during the same period for His Excellency the Viceroy's Cup, which is for all classes, and if the subsequent careers of all those horses could also be traced, it would be interesting to see how many of the former, and how few of the latter, had afterwards served the State, as Officers' chargers or otherwise.

To return from the above slight digression.

Not long after the suppression of the Indian Mutiny, there occurred a memorable and serious interruption in the supply of Bombay with Arabian horses, owing to the issue by the Porte, in 1863, of a notification that the exportation of horses from its dominions had been prohibited; the reason alleged being that the blood-horses of the country were disappearing.

It so happened that the Governor General of Turkish Arabia at that time was Nàmik Pasha, a man who generally managed to keep the reins tightly in his hand. The long frontier between Irak and Persia, from Kirmanshah in the north, to Muhamra in the south, greatly favoured the taking of horses out of the one jurisdiction into the other, for shipment to Bombay at some port on the Persian side of the Gulph. Nevertheless, H. E. Nàmik Pasha was able to establish so good a check that export on the whole ceased. The Arab stables in Bombay, after standing empty for a time, were all turned by degrees into cotton stores, or carriage repositories; and it looked as if the capital of Western India had lost for ever one of its most interesting features.

In 1867, the prohibition was taken off again. The pent-up trade then instantly began to flow as before. Indeed it would appear that, although very few Arabians had reached Bombay during the seasons now alluded to, yet they had continued to be bought up and sent towards the coast. For, in 1865, when Colonel Pelly halted in the seaport town of Kuwait, not far from Basra, on his way to visit the Wahabi capital, he found its Shaikh collecting in a fort in the adjoining desert the horses sent down in small detachments from the Inizah and Shammar tribes, or drawn from the interior of Najd itself, and freshening them up after their long desert marches with artificially watered lucerne, until they could be shipped to Bombay.

In 1873, the Porte again prohibited the exportation of horses from the Provinces of Baghdad (Turkish Arabia), Syria and Aleppo, assigning as the reason the extent to which it was being carried. This embargo is still in force, although no one visiting Bombay in the winter months would ever think so. Not until he left Bombay in the direction of Basra, and got near the sources of supply, would he awake to the discovery that, in as far as Firmans and Custom-house regulations could avail to do so, the traffic was sealed up.

Thus, in 1874, when the British Resident was leaving Baghdad, it was only with the utmost reluctance that the Governor General of the Walaiat gave permission for his taking with him his riding horses.

Again, in 1881, when the Government of India was obtaining from Baghdad ten or fifteen Arabians for its Horse-breeding department, much difficulty and delay occurred before Her Majesty's Ambassador at Constantinople could obtain from the Porte a decree to enable them to be sent out of the country.

Similarly, only the other day, the head of the Customs department of the Baghdad Pashalik laid the local manager of the Euphrates and Tigris Steam Navigation Company under strict orders not to receive horses on board the Company's steamers leaving Baghdad; a strong measure, seeing that those vessels go no further than Basra, a port within the Ottoman dominions.

When the above facts are considered side by side with the well-filled state of the Arab stables in Bombay every year between October and March, a striking commentary on the administration of affairs in the Ottoman Empire is afforded.

The effects actually produced at the present time by the embargo are chiefly these:—(1) It interferes with the inflow of Indian money into the country; (2) it checks the breeding of horses, especially among the cultivating and more or less settled communities of Syria and Irak; (3) it diverts into the pockets of a number of persons having no right whatever to it, all the money which would be realised by the Customs department of the Ottoman Government if the trade were free and the dues levied on horses moderate; (4) it drives the traffic into secret channels, until it has really come to this that, except for mares and very young stock, Bombay is probably a better market than any town in the Ottoman Empire in which to buy Arabian horses; (5) it adds to the price of every horse landed in India a certain considerable

percentage, merely to cover the risks of those engaged in an illicit traffic and the *douceurs* paid en route principally to the petty Shaiks of sea-ports like Muhamra on the Persian side of the Gulph.

It is not to be supposed that facts so palpable as these elude the notice of the responsible authorities, or that our Ambassadors at Constantinople have omitted to remonstrate against a policy equally inconvenient to the Government of India and detrimental to the Porte. But, somehow, the representations of the Baghdad revenue authorities, as well as those of our Embassy, have failed, so far, to lead to the embargo being removed. The prevailing idea as to its depending less on the Ministers of the day than on the will of His Majesty the Sultan is thus more or less confirmed. It is said that when agents are sent out to buy horses of ideal size and excellence for the royal stables, their excuse for failing to procure them always is that the best have been taken to India ; and that it is this, rather than considerations of general policy, which leads to the restriction being maintained. Under personal government this is likely enough ; and it is impossible, therefore, to surmise how long the embargo may last ; at what moment it may be taken off ; and, if taken off, when it may be re-imposed.

## SECTION II.

### THE HORSE-SUPPLY OF ARABIA WITH REFERENCE TO THE MILITARY REQUIREMENTS OF THE GOVERNMENT OF INDIA.

Some would call only those horses "Arabians" which are of pure blood and bred by Bedouin, that is, strictly pastoral and non-cultivating tribes. But this would be like confining the term "English horse" to strains entered in the stud-book ; and it seems more practical to reckon every horse an Arabian whose natural *habitat* is anywhere in the country occupied by the Semitic or Arab populations of Asia at the present day. With this view, as a basis, all the horses of Arabia may be classified thus :—

A.—The thoroughbred Arabian ; or horse *par excellence*, of the Bedouin.

B.—The Arabian of non-Bedouin, yet not exactly settled, tribes.

C.—The Arabian as bred in towns and villages.

Those three great groups will now be considered separately.

#### *A.—The thoroughbred Arabian.*

In Lady Anne Blunt's "Bedouin tribes of the Euphrates" (1879), and in the late Major Upton's "Gleanings from the Desert of Arabia" (1881), will be found lists of the multitudinous tribes composing the two rival Bedouin nations of the Inizah and Shammar ; as well as of the innumerable strains into which their thoroughbred stock has branched out, like the "Waxys," "Buzzards," "Partisans," and so forth, among our own. Therefore, the same ground will not be gone over again here, or any attempt made to unravel the mysteries of *Al Khamsah* ; that is, "the five" (real or fabulous) mares to which the origin of all thoroughbred Arabian stock is traced.

The same and other books further show how easy it is, even for Europeans, to visit the Inizah and Shammar. These prey on one another like the fishes of the deep; and cases have occurred of whole tribes being gradually swallowed up by the rest. But they are good to strangers, and too fond of welcoming such as buyers to do anything to frighten them away. There are other Bedouin tribes, for example, some of those in Najd, whose temper is different, and to whom an evil reputation clings. The vast district of Najd, forming the peninsular portion of Arabia, between the Red Sea and the Persian Gulph, formed the original home both of Inizah and Shammar. But when first the latter, and afterwards the former, pushed out of it towards the north to find wider pastures for their flocks, they left, of course, numerous horse-breeding and strictly Bedouin tribes behind them, and there is every reason to believe that Najd contains strains of the thoroughbred Arabian with which the Inizah have had nothing to do. By this it is not meant that the Arabian, as now bred by the Bedouin of Najd, is of another origin than that bred by the Inizah Bedouin in upper Arabia; or that the two differ from one another much more than, say a line of Kingston's bred in Scotland would from one of Melbourne's naturalized in France; but merely that there are in Najd strains of pure Arabian horses which have never left it, and which may properly be described as indigenous to it.

Strictly speaking, every pure Arabian horse, whether in the possession of Inizah or of Shammar, may, like the Inizah and Shammar themselves, be said to be of the race of Najd; but this is another thing altogether from every thoroughbred horse in Najd being called an Inizah.

When Mr. Blunt visited Baghdad, the Residency Surgeon there told him that, in 1854, he had traversed part of Najd in the suite of Colonel Pelly, from Kuwait to Riâzh, and seen but one mare, and that a small insignificant animal, during the journey there and back. But this is no more to the point than if it were to be stated that because a party had marched from Puna to Nagpur without meeting any tigers or bands of robbers, Western India was free from such! The provinces of Hassa and Katif are well known to contain Bedouin of a very truculent type, resembling those who the other day destroyed our unfortunate countrymen near Mount Sinai, rather than the hospitable and chivalrous Inizah; and wherever, in Arabia, the Bedouin life is led and water is to be found, there will be the Bedouin mare.

In 1872, a well known European merchant of Baghdad who was returning to Switzerland, set out from Basra on a camel, attended by two Arabs, to ride *viâ* Aleppo to the Mediterranean. On the second day he had hardly mounted after a halt, when more than a hundred Bedouin of the Ujmân tribe, who had secretly surrounded him while resting, just as the Zulus did the unfortunate Prince Napoleon, suddenly showed themselves, stopped him, stripped him and his servants to the very skin, took away their camels, and turned them adrift, after a debate as to whether their throats should not be cut. To the European they threw an old rag, which he made into stockings till it was worn out. Not till after two days wandering did the poor

man and his servants reach the Euphrates, and obtain food and Arab clothes. This was in May when, owing to want of water, horses cannot be taken very long journeys in Najd, and the robbers were all on camels. Still, the very tribe to which they belonged (the Ujmàn) is known to have excellent horses too; and, last year, a resident of Baghdad commissioned a horse-dealer of Kuwait to visit them and buy for him some of their best. The old dealer knew them too well to go among them with his belt full of liras. What he did was to send his son with the money from Kuwait, at the head, to Katif, towards the middle of the Arabian littoral of the Persian Gulph, in a coasting boat, with orders to strike inland from Katif on a camel to Hassa, where there is a Turkish garrison. The father then mounted his camel at Kuwait, with next to nothing in his pocket, and holding south, kept throwing himself in the way of parties of Bedouin when they came to one of the few wells in that parched region. In this manner three horses were obtained, after as many months of labour, and paid for by orders on the son, who was waiting with money in Hassa, and improving the opportunity to buy inside the town, for a few pound a head, a number of spidery horses for the Bombay market, where they must by this time have made their appearance and in all likelihood been accepted as "*high caste* (a Hindu phrase entirely) *Najdis*."

Of the three horses sent up to Baghdad, one was an unformed colt, but the other two were noble horses (one a four year old, the other seven), standing fifteen hands and half an inch, girthing sixty seven inches, and measuring rather more than eight inches below the knee. The older of these two, a very dark bay, reminded one in many of his points, of the best picture that has come down to us of "Flying Childers," but looked more like galloping all day at his own pace than eclipsing others over one or two miles.

A description of the three horses now referred to, and of their several excellencies and defects, would, did the limits of this paper admit of it, bring out, when considered side by side with the manner in which they were procured, the following facts:—(1) Najd, however much the distribution of the equine race over it may be restricted by scarcity of water, contains thoroughbred Arabians of a very different stamp from those commonly recognised in India as "Najdi horses;" (2) it is even more difficult to obtain good specimens of such than of the horse of the Inizah, partly from the natural aridity of Najd making it far harder to travel in than the pastures of the Hauràn and other resorts of the Inizah; but chiefly because of the uncertain temper of its tribes; (3) the one cardinal belief which has done so much for the Bedouin, that is, their extreme faith in purity of blood, has by no means brought them abreast of Europeans as horse-breeders. Of mares of certain strains they will tell one that "*their sons may be bred from in a dark night*," thus revealing that, in their opinion, it signifies nothing whether a stallion's forelegs are straight or crooked, his hocks sound or spavined, or what hereditary defects he has, provided only he is true-bred; just as if '*noblesse oblige*' was not equally true, though in

a different sense, of horses as of men; and a Saklâwi Jadrâni or Hamdâni Simri, with flat sides and sprawling hindquarters, was very greatly the better for his pedigree. As a matter of fact, their best strains contain many horses such as no European judge would buy, and as the only persons who can visit them, at all events in Najd, are as blind worshippers of mere blood as themselves, one who proceeds in this way must be prepared for many disappointments, before getting even one horse in which the requisite points are united, without neutralizing defects.

Most of the horses sent yearly to Bombay from Najd are bred in or near towns like Kuwait, Katif and Hassa, where cultivation and water prevail. Horses and ponies of nondescript kinds (Kadish) are used in Arabia, like bullocks in India, both for packs and in farm or garden work; and the produce even of mares of this despised class finds ready sale in Bombay. Village and suburban Shaikhs also keep mares of the best kinds they can procure, and of course have no difficulty in getting such served by Bedouin stallions, and in rearing for the Indian market in this way larger and more showy animals than the desert born and bred themselves. And yet, all this being admitted, it is not to be doubted that Shaikhs like Yūsuf Bin Badr of Kuwait and others, have long been in the habit, when desirous of obliging their Bombay correspondents, and not merely of making a large profit, of sending round colts of the very choicest strains in Najd, bought or received as presents from the Bedouin of the adjoining deserts.

A fact so well known indeed would not need to be stated, but for an impression to the contrary which has got abroad. Thus, about twenty years ago, a European Consul at Aleppo wrote to a friend in India a letter, afterwards published in the "English Sporting Review" (March 1864), roundly stating that "*there was blood and stride in the desert which had never been seen out of it.*" This sounded improbable, for indeed it is doubtful if even the ocean itself contained creatures such as man has not made himself acquainted with. However that may be, the author of the statement received from his friend in Bombay a contract, or order, for the supply, at a considerable sum per head, of a large number of Arabians of the, by his showing, hitherto unknown or undiscovered kind; and it is said to this day in Baghdad that it was the magnitude of this transaction which first led to the export of horses being forbidden. Shortly before the embargo was put on, about twenty high class horses, selected by the Aleppo official alluded to, passed through Baghdad on their way to India. One or two of them may afterwards have won a few races at Byculla, though it cannot be said that, from this point of view even the best of them equalled, far less excelled, hundreds of their predecessors which had found their way to the country in the ordinary way. At stud, as was to have been expected, some of them answered better; one in particular ("Caractacus"), having got some very superior stock from native mares in Khandeish and other districts of Western India.

Similarly, in 1863, an officer of the Hyderabad Cavalry sent an Indian Muhammadan to buy Arabians from the Inizah; but all he got, in return for unstinted outlay, was three animals of pure blood, one of them a weed and spavined; another not fit for anything better than peacocking round a band-stand; and the third too slight-limbed to stand the necessary preparation for the starting-post.

The truth is, there are almost as many 'wretches' among thoroughbred Arabian, as among thoroughbred English horses; and it is nonsense to write of the one, any more than of the other, as if the perfections of a "Stockwell" or a "Child of the Islands" were distributed anything like generally among individual members of the two classes respectively.

Reference has been made above to the several channels through which the thoroughbred stock of Najd may find its way to Bombay; and it is not to be supposed that the same thing does not happen with the thoroughbred horses of the Inizah. From this point of view, indeed, the world seems at times but a small place. For example, it is easier now-a-days to find a thoroughbred Arabian in Sussex than to search for him in his native solitudes; and when part of the Crabbit Park collection was sent up last year to Tattersall's, the stallion "Pharoah," which had been bred by the *Rasâlin* (a branch of the *Sabaa*) Inizah, in the Haurân, and taken to England by Mr. Blunt, was bought (for about £600 by the way) and sent to Poland. Similarly, though Baghdad may not sound a likely place for terriers of the Pepper and Mustard race, immortalised in Guy Mannering, yet, owing to there being a Scotchman here who cultivates the breed, and has correspondents among the Liddesdale store-farmers, a puppy obtained from him might chance to prove a truer specimen than it would be easy for a stranger to procure in Scotland, especially now that so many of the old-fashioned breeds are being altered to please the judges at dog-shows.

Not to mention the numerous emissaries of foreign governments who have visited the Inizah Bedouin from time to time, and bought some of their best horses and mares, or exceptional travellers like Mr. Blunt, it is known that in Aleppo, Damascus, Basra, and elsewhere, there are generally consuls, governors, merchants or others, both European and Turkish, who, not less than the inhabitants of those towns themselves, habitually buy colts from the Bedouin, whether for their own use or for re-sale. It was thus that some of the fathers of the English stud-book were obtained; the famous "Darley Arabian," for example, imported nearly two hundred years ago by a Mr. Darley (a Yorkshireman), whose brother was settled at Aleppo.

At certain seasons, even the wildest of the Inizah tribes spread their black tents over miles of ground within convenient distances of Aleppo, Dair, Damascus and other centres, merely, as they say, to buy dates and coffee, but probably with a shrewd idea also of making money out of the townsmen.

Even Baghdad is approached yearly in this way by hordes of the Inizah and Shammar. Last October, when the writer spent a



day or two in a vast encampment of the *Hazhzhâl* Inizah, two days journey from Baghdad, he found it full of buyers from all points of the compass. Most of these were of the *Ukail* (also spelt *Aghêl*) tribe, who are the great carriers of Arabia, and having constant occasion to visit the Bedouin to purchase camels, often buy good colts from them also. On the occasion alluded to, the market had been so brisk, that in the form of young stock, only one eligible colt and one foal of pure blood were left. The former was a three year old; plain, but with a great deal of character; and, as he was bringing in money as a stallion, his owner asked two thousand Rupees for him, and was highly offended when just a quarter of that sum was offered. He afterwards came down in his price by more than half; but, as a name for having but one word was worth fifty colts; he was allowed to keep him. The foal was only six months old. Its sire had been bought for Bombay and its dam had died. The little creature had been brought up by hand in the tents of Shaikh Fahad, the present Chief of the *Hazhzhâl*, and it was said that nothing would induce its foster-mothers to part with it. However, Rupees two hundred was offered, and although this had no effect just then, a few weeks afterwards, the animal was sent in, and the money accepted. No one but a European would have given so much, and buyers for India seldom take such immature stock, owing to the difficulty of rearing it till old enough for export. The three year old again had not been bought for India, simply because no ordinary dealer could afford the price. Rupees 1,000 a head in Bombay is a very high average to hope for, even when the selections are of the choicest, and several of them likely for the turf. Buyers with short purses have, therefore, to wait patiently, before getting anything superior, except by chance, for some of those opportunities which often reward those who know how to look for them. For instance, at the moment of writing, the owner of the colt alluded to is understood to be out with a party of raiders. If he have luck, he will ask more than ever for his colt; but if he come back shorn, he will sell him for anything he can get, seeing that colts near maturity, when not *specially* prized as stallions, are more or less in the way, among people who prefer to ride mares.

Of the thoroughbred Arabian as found among the Shammar, much need not be said. Just as *our* thoroughbred is one, wherever met with, from New South Wales to Canada, so is the thoroughbred Arabian one, equally among Inizah and Shammar, Christians and Turks. The only thing is we have our stud-book—and without it we would be lost—while among the Bedouin nothing of the kind is kept up.

The Shammar, though less numerous than the Inizah, fully equal them in prowess. Their Chief of the day, Shaikh Farhân, has accepted a stipend, and the title of Pasha, from Constantinople. But his younger brother, Fâris, the hero of much desert song, still does his best to keep the chivalry of his nation together on the old lines, amid all the changes of the time. And yet the Shammar themselves do not pretend that, as horse-breeders, they have followed as strictly as the Inizah the priceless canon of "*blood; all blood; and nothing but blood.*" On the contrary, a kind of tower of Babel seems to have fallen on their

horse-stock, and mixed it all up. Hence the Inizah, when referring to a Shammar-bred colt, always do so with contempt. When, in the constant warfare that goes on between the two nations, Shammar mares are taken by the Inizah, they by no means admit them to an equality with their own, but if they do not get rid of them, carefully keep their stock separate. The Shammar, on the contrary, when they carry home, whether as part of a dowry or as a booty, an Inizah mare, value her progeny more highly than their own. All this is right in the desert. But Europeans may merely be standing in their own light when, in imitation of the Bedouin, they affect a too wholesome contempt for Shammar horses. Just as in an Inizah encampment one desirous of buying only true-bred horses should guard against taking, by mistake, Shammar stock, so among the Shammar, there is always a chance of finding specimens of the best and purest blood in Arabia, bought or raided from the Inizah. At the worst, the most uncertainly bred animal in all the train of Shaikh Fâris, or Farhân Pâsha, if called a thoroughbred at all, must be safer to breed from than the 'Norfolk trotters' which high authorities believe to be now getting good stock in India; and all things considered, the resources of the Shammar should by no means be overlooked in connection with the Government of India's requirements.

The thoroughbred Arabian, though he must occasionally find his way through accident or otherwise into the ranks of the Indian Light cavalry, is of less interest to India from a remount than a horse-breeding point of view.

It is true that the Arabian horses which have been made available of late years to Indian breeders have not always found favour. Their produce, it has been thought, has often shown want of bone. An altogether larger stamp of horse (more like the "Norfolk trotters"), has been asked for; and seeing that the mares are the property of the breeders, not of Government, it is found necessary to try and meet their wishes in this respect. The question has therefore been put whether among non-thoroughbred stock large horses, with good bone, not of recent cross, but true-bred for two or three generations, could not be found. Before this could be answered, much difficult and expensive travelling would have to be gone through; and in countries where there is no stud-book, and large classes of breeders are careless as to purity of blood, it would be hard to tell, even of the best-shaped horses, whether they were true enough bred to stand a good chance of reproducing their own qualities and conformation.

Considering how many of the Arabians offered by us to Indian breeders as stallions are not thoroughbred at all, or if thoroughbred, have been bought in the first instance solely with an eye to racing, the question arises whether it would not be worth while for Government, before ordering search to be made for shapely mongrels, to see what its Panjâb farmers would think of thoroughbreds selected specially for them, by a good judge, in the desert itself.

Even if this were to be resolved on, there would be difficulties in the way. Our political Residency in Turkish Arabia costs India about a lakh of Rupees a year; and the purchase of stallions from time to

time for the use of Indian horse-breeders is a duty which the Resident is very reasonably required to perform. How he is to acquit himself of it successfully is not so easily seen. If he intrust the task to a Baghdad horse-broker, the money will simply be divided among a number of people with but little right to it, and, in all probability, not one true-bred horse obtained in return for it. Supposing him, if a competent judge, to leave his duties and go out to buy horses from the Inizah, not only would his movements be regarded by the Ottoman Government much as those of a Russian Consul in India would be if he were to start off on a round of visits among the frontier Rajahs, but the mere sight of an English 'Beg,' or official, coming to buy from them would so inflame the cupidity of the Bedouin, that even if he were to find among them mature horses of the desired stamp, and free from hereditary defects or unsoundnesses, he would have to pay absurd prices for them. So many requisites go to make a right good stallion, that it is impossible always to be sure of obtaining even one just when wanted; no matter how much time, labour and money are expended in the search.

The likeliest way round this difficulty that can here be thought of is to instruct the Resident in Turkish Arabia to buy, every season, a few yearlings from the *Sabaa*, *Rāwāla*, and other Inizah tribes, rear them at his headquarters; sell those that did not shape properly; and send on the others, when four years old, to India.

This would be comparatively easy. An experienced horse-dealer would not have to be employed to buy, where mere yearlings had to be chosen. Any Arab of ordinary intelligence would suffice; for purity of blood would, at that age, be the chief thing having to be considered, and as to that, the simple word of the Bedouin is enough. Size and shape would have to be left more or less to chance, not uninfluenced by subsequent good keep; and the prices would be so small that if one in three proved in the end up to the mark, he would cost Government, as a four year old, quite a moderate sum, as the others would fetch good prices in Baghdad.

The rearing of the youngsters would be a simple and inexpensive matter; involving only the rent of a few acres of waste on the banks of the Tigris or Diāla; the purchase of two pairs of ponies to work the rude irrigational pulleys of the district, and the wages of a few cultivators to keep the land under beans and barley. In Irāk, barley is sown in autumn, and, when irrigated, comes up with great vigour. All through winter, when young thoroughbreds in England are being starved in straw-yards, or running up bills for hay and oats, it is either grazed over, or cut as fast as it grows and sold in the town as fodder. And yet, after months of this treatment, when allowed at last to ear, it yields on the threshing-floor an excellent harvest of straw and corn. By that time the influences of spring, and of the winter rains, have clothed the ground in many places with a growth of nutritious grasses; on which stock, when taken off the growing barley, continues to thrive amazingly.

The above are some of the natural advantages which, though not unattended with drawbacks, such as the want of paddocks or inclosures, help Arabian horse-breeders. Another is the climate which makes shelter unnecessary, except at night, for fear of robbers, and during the autumn heats.

The Porte's objections to the export of horses evidently add to the necessity of the Government of India's endeavouring to improve and increase its indigenous supply.

No doubt landholders in India find it preferable to breed for Rajahs than for Government. The private buyer will give a long price to please his fancy; not so purchasers for the Service. The former, too, will take a two year old as readily as a four year old; while Government will not; and will generally be satisfied, with size and "lucky marks," without raising nice questions about spavins and other points. To a certain extent, as admitted above, the complaint against Arabians may be fairly due to the unsuitableness of the animals of this class hitherto chiefly offered to breeders, whether retired race-horses, non-descript chargers that have served their time, or what. So far, the remedy is simple, and has already been stated, namely, place within reach of the land-holders, Arabians of the same high class as those taken to Europe by Mr. Blunt and others.

The call for stallions of the coach-horse, or Pickford's van, stamp, may, however, also be partly due to the desire just adverted to of producing stock such as Rajahs and others will take as two years olds, sound or unsound, provided they are big and fleshy.

In how far it concerns Government to import animals calculated, or expected, to get stock such as native buyers will thus snap up, is a question for its consideration.

The points aimed at all throughout these remarks on the thoroughbred Arabian are:—(1) He has seldom been seen hitherto in India except on the turf, excellence on which is a very poor guarantee of eligibility for the Government horse-breeding department: (2) If true-bred and properly shaped Arabian stallions were placed at the disposal of the Indian breeders, it seems scarcely possible that the very strains which have made the English thoroughbred what he is would fail to raise the breeds of India to as high a level as the climate and other circumstances of the country will admit of: and (3) The best, if not the only practicable, way for Government to obtain such stallions would be to cause the Resident in Turkish Arabia to buy them, as yearlings, on the system above described.

*B. The Arabian of non-Bedouin, but not exactly settled tribes.*

The word *Badwu* with the definite article, and *Badwun* without it, means in Arabic, a desert; that is, not necessarily an uncultivable, or sterile, tract of country, but one in which there are no towns or villages, cultivators or cultivation. The adjective derived from it is *Badawī*; that is, an inhabitant of such a tract—a nomad of course—and it is the plural of this (*Bāddāwīyūna*, and in the oblique cases, *Bāddāwīyīna*) which has come into use as a collective noun, and also as an adjective,

in the form of *Bedouin* or *Badawîn*. Between Bedouin and non-Bedouin tribes there is this palpable distinction that the former never cultivate but trust for subsistence and wealth chiefly to their vast flocks of camels and sheep; while the latter, however rich in flocks and herds, do not despise the plough.

A list of the non-Bedouin tribes merely of Turkish Arabia, (Irāk) would cover several pages. Well demarcated as these are, as a whole, from the Bedouin, yet some of them, such as the *Muntafik*, *Miydân* and *Banilâm*, touch or resemble in mode of life those desert nomads, just as others, at the opposite extreme, do the communities residing in villages.

It forms the Porte's constant endeavour to induce as many of these tribes as possible to settle: and the further removed a tribe is from the true Bedouin type, the better the Government's chance of turning it into a body of tax-paying subjects. But with all that can be done, these semi-Bedouin tribes are still far removed from civilization. Many (but not all) of them are better at raiding, on the backs of their mares, on their neighbours' flocks than at watching their own fields and folds. Sometimes they even come in collision with the Government, and troops have to be sent out against them from the nearest garrison. But by fighting a little and running away a great deal, they generally manage, like the Momands and Shinwâris, and other friends of our own, to get the best of it even then. The officer commanding the operation writes reporting he has "entirely dispersed the enemy;" but dispersed or not dispersed, there they remain all the same.

It follows almost without saying that tribes like these, having the whole of Mesopotamia, on both sides of the Tigris and Euphrates, as pasture ground, and depending on the qualities of their mares for the protection of their flocks and the carrying off of those of others, breed large numbers of good horses.

Many a hero of Indian race-courses during the last eighty or a hundred years would appear to have come, for example, from the *Muntafik*. How many, or how few, of those have been pure-bred is a different question. Whatever may hold good of the 'Anglo-Arabian,' or thoroughbred horse of England, it seems certain as to Arabians, that many a horse very far from thoroughbred has been able to gallop his two miles in India, racing all the way. As a matter of fact, the tribes now alluded to are even less particular than the Shammar as to blood, and their strains are greatly mixed. To visit them in search of thoroughbreds would, therefore, be like looking for a sovereign in a hay-loft: and it is worth remembering also that, whereas, in England crossing has itself become a science, it is very different in Arabia, where the moment the strict line of pure breeding is departed from, nothing but a vast chaos of mongrelism lies before one. Still, as has been seen, there is practically no limit to the distribution of horses, and there is, therefore, no place in all Arabia where the thoroughbred may not casually be found.

These non-Bedouin tribes differ greatly as to the extent and quality of their horse-supply. Those whose country is near Najd and

who follow more or less the Bedouin life naturally have the best; but even among them the spread of firearms, if not perhaps in some small degree also the gradually riveting of the Ottoman yoke, is making the swift mare less necessary than formerly. All last winter a miserable little tribe, or branch of a tribe, spread their black woollen blankets, by way of tents, on the banks of the Diâla, near Baghdad, to feed their sheep and camels, and raise a little barley on patches irrigated by the river's overflows. These had with them a number of mares, and carried the long Bedouin spear. Their stallion was the merest mongrel, and 'wretch' altogether: but, from knowing no better, they thought him perfection and credited him with a pedigree which would have made an Inizah laugh. They had of course a good many colts, from six months old up to three years. But keen watchers as the Baghdad horse-dealers are for any animal out of which money is to be made in Bombay, there was only one of them all they would take at any price. That was a fleshy two-years old, with every drop of blood he had inherited from all his ancestors concentrated in his head, which was, therefore, good, all except the eyes. A dealer bought him for about a hundred rupees, and has had him tethered all winter in his yard in the town, ready to be sent off to Muhamra, with his first batch when the season opens next September. By that time, he will have been fattened up into a large upstanding animal. If bought as a charger, he will pass muster, and the trappings will hide some of his coarse points. But if in his old age, through the interest of friends, he obtains a place under the horse-breeding department, he will not improve the reputation of the class of stallions he will (quite erroneously) be said to represent.

### *C. The Arabian, as bred in towns and villages.*

Embargoes on export can only affect slightly, if at all, production as far as the Inizah, Shammar, and the tribes generally are concerned. These do not breed horses for sale. The blood mare is as much a part of their life as the spear and the cloak; and if there were no buyers of their young stock at all, the foals would still make their appearance in spring with the lambs and the young camels.

But it is different with the settled part of the population of Syria and Irâk. By them also the horse is largely used; not indeed as a means of attack and defence, but for the humbler tasks of the road and farm. There is no doubt that, if the Ottoman Government would foster, instead of checking, horse-breeding throughout these rich and fertile provinces, a practically unlimited outturn of animals well adapted for military purposes would be produced. Even as it is, the supply is a large one; and probably about two thirds of the Arabians that go to India are bred, not by tribes, but by these settled communities.

No general description would apply to these horses as a whole. To refer, as some do, to the "Baghdad horse" or the "Syrian horse," is almost as meaningless as if one were to speak of the Bombay horse or the French horse.

The truth is, there are few, if any, strains of blood in the whole of Western Asia which have not been, and may not again be, infused

into the horse-stock of Syria and Irâk. Travellers from the four quarters, very variously mounted, are constantly traversing the country; and a Turkoman horse which had cost more than £200, as a colt, at Mashhad and won races at Hirat, was sold lately in his old age in Baghdad, for about the same number of Rupees, to one who has placed him at the townsmen's service as a stallion. Nothing more likely than that his stock will after a time be seen in Bombay; and if some of them should prove great racers, it would not be surprising. Many of the Government officials, both civil and military, are fond of horses. When transferred, they carry with them the horses of one province into another province, and, having excellent opportunities in the course of their duties of obtaining superior horses from Shaikhs and others, often have stallions good enough to improve the breed of a whole district. The only thing that prevents the horses of Europe from playing their part in the production of this great mixture is the sea. Travellers from the West enter Syria by rail and steamer, and do not, therefore, carry horses with them. A French or English army disembarking on the Mediterranean or Black Sea littoral, and penetrating towards Turkish Arabia, could hardly fail to leave a number of horses among the people; just as Lord Napier's Political department did among the Galla and other tribes of Abyssinia. At present no distribution of this kind would appear to be going on. A late English Consul at Aleppo indeed had a fancy for importing English thoroughbreds. According to an account of his proceedings in a letter to a friend published in an English Magazine (1864), he (1) sent thoroughbred English mares to Arabian stallions, thereby obtaining stock, handsomer (in his opinion) than English horses, without being faster than Arabians: (2) put thoroughbred English horses to the best Arabian mares, three out of four of the produce proving "leggy, weak, and unfit for racing:" and (3) reared thoroughbred and uncrossed English stock in the desert, on dry food, the result being animals smaller in size than their parents, but better able (as he judged) to stay a distance. These experiments must have put a certain amount of English stud-book blood in circulation in the country round Aleppo. Bedouin breeders of course looked on the foreign thoroughbreds as the merest *Kâdîshes*, or mongrels. If by some mischance "Stockwell" himself had got an Inizah mare in foal, the owner would have been in despair, and a rude operation known in the desert would in all probability have been performed for the extraction of the embryo. But the people of Aleppo and its neighbourhood are less particular, and but for the wholly unappreciable effects producible by such a small quantity of English blood on the infinite admixture of races making up the horse stock of Syria and Irâk, these experiments of the Ex-Consul's would have to be taken in qualification of the statement that western blood had not been infused into it.

At present, so far as can be traced, there are no European horses or mares in Aleppo, Damascus, Baghdad, or any other town of Syria or Irâk. Still, what has happened before may easily happen again in this respect. If the French or English Consul, or a European

merchant of Baghdad, for instance, were to take it into his head to import a thoroughbred stallion and a few mares from England or Australia, with a view to breeding uncrossed stock, there would be a ready sale for the produce; and race-committees in India would be puzzled how to classify colts thus bred when landed in Bombay by dealers. If even one English stallion chance to become located in Baghdad, many townsmen, especially Christians and Jews, would send their mares to him, provided his points were good: and one variety more of the Irâki horse would thus be produced. Therefore, although as matters now stand, it is wide of the mark to say, as is sometimes done in India, of an Arabian horse of superior size, especially when also a racer, that he must be partly of English blood, there is nothing impossible in the idea, provided always no one ever thinks that the *Inizah* would send their mares to English stallions, however full the country might be of such. As a matter of fact, the uncrossed Arabian ranges in height between thirteen and fifteen hands. Even among the Bedouin, horses of upwards of fifteen hands at the withers are comparatively not less common than men of six feet are in England. The breeds of Syria and Irâk again, as has been seen, are crossed so variously, and are, moreover, as a rule, reared so liberally, that the infusion of English blood is by no means wanted in order to make them grow into large horses. Height at the withers is anything but a scientific gauge, it may be observed in passing, of a horse's size. All it may show is how high above the ground his rider will be raised; even although the elevation may depend merely on a set of long legs. For a racer, height at the croup, depth of chest, or length of shoulder and quarter, would each perhaps be a measurement more to the purpose. But however measured, the horses distributed over Syria and Irâk often really deserve to be called "big" horses, especially when a strain of Turkoman, Persian or Kurdi blood is present.

From all this it is clear that these are not horses for the Government of India to think of as stallions. Leaving out of view exceptional animals obtained by Europeans or others from the *Inizah*, the very best of them are, in Arab parlance, not horses at all but merely "sons of horses;" that is, the produce of blood stallions out of inferior mares. The way to reproduce animals of this class is to breed, not from the individuals themselves, but from their progenitors.

It will also have become apparent—(1) that there can be no countries in the world better calculated than Mesopotamia to yield horses in large numbers and at moderate prices for military purposes: (2) that its resources in this respect are heavily handicapped by the embargo on export: and (3) that notwithstanding all difficulties, India is freely supplied, year after year, with remounts from this quarter.

It is not likely that the landholders will rear colts merely to see them taken possession of, at arbitrary prices, by some official acting in the name of Government. Numbers who, under a sounder system, would be horse-breeders, prefer investing their money in sheep and buffaloes, or in camels. Colts bred for sale are sold off on the first



opportunity partly to caterers for India, partly to officials, and partly to townsmen. The military department of the Ottoman Government itself is among the losers; for, instead of being able to buy remounts fit for service from its own subjects, it is driven to obtaining them from the unsettled and unsubjugated tribes of Persia and Kurdistan.

If ever the Government of India, to meet an emergency, were to send an agent, armed with a permit from the Porte, to buy remounts in Turkish Arabia, comparatively few of the right age would be found in the hands of their breeders.

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### SECTION III.

#### THE ARABIAN HORSE IN BOMBAY.

From all that has gone before it will have appeared that horses eligible for stud purposes need hardly be looked for in the Bombay stables.

The few thorough-breds landed every season, when not private importations, are either dwarfs that have got into a dealer's string by accident, or selections for the turf only. In the latter case outsiders seldom have a chance of buying them, at all events after the first few hours, as they are sure to be set aside by one or other of the local stable-keepers, who are always on the look out for race-horses.

It can rarely answer for the Government to obtain passes from Constantinople to enable dealers to import a certain number of horses on the stipulation that Government should have the pick of them for stud purposes at a fixed price. The dealer thus favoured looks out for racers, not stud-horses; and nothing pleases him better than to have his selections rejected by Government, so that he may sell them to others at his own prices. A case in point was the Arab race-horse "Revenge." If there was a thoroughbred in all the lot of which he formed one, it was he. But when, in terms of his contract, the importer offered him to Government, the accomplished Superintendent of Horse-breeding Operations very properly rejected him, because of the defects or infirmities of his forelegs. His owner then sold him to a brother dealer and turfite, by whom he was afterwards resold for Rs. 10,000, for racing purposes of course.

The men who bring over horses to India do not always know a great deal of their history. It is scarcely necessary to state that none of these people are Bedouins. Numbers of them are mere grooms, servants of Shaikhs or breeders residing on the Persian Gulph. In such cases they may have known their charges since they were foaled, but will seldom confess to one that a horse is town or village-bred. Others are bonâ-fide dealers, whose selections are, in part at least, their own property. Most perhaps of these are of the *Ukail*, or carrier tribe above alluded to. Very many are inhabitants of Kuwait or of Basra, of the districts of Kirkûk and Sulimânîa, high up the Tigris, where, owing to frequent infusion of blood from the neighbouring tribes of Kurdistan, large horses are common and cheap.

In Baghdad, Basra and Kuwait reside whole families engaged in the Indian horse trade. Those of Kuwait and Basra, as has been seen, make up their strings from Najd, or from tribes like the *Muntafik*, within easy reach of the Persian Gulph; or by purchases from the numerous travellers from every quarter who are constantly halting near Basra on their way to Persia or India. The Baghdadi dealer again, while freely tapping the Shammar sources of supply, draws chiefly on the produce of the cultivating communities of Irāk. Owing to the trade being illegal, and to Baghdad being the seat of Government of the Pashālik, these have all to work warily. Though some of them have plenty of capital, they cannot venture on setting up regular stables, far less suburban runs or farms. Everything has to be kept as secret as possible. One brother, or partner, usually stations himself in Bombay to receive and superintend the sale of consignments, and report from time to time the state of the market. Another lives in Baghdad, purchasing Irāki and other colts, at an average of about Rs. 150 or less a head. These are kept through the winter in the small court-yard of the dwelling-house, fattening on green food, and seldom being exercised. In spring, they are all taken out into the wilds, with iron fetters on their fore fetlocks, and pastured like sheep on the innumerable grasses then in flower. Occasionally there is a third brother who makes excursions even as far as Aleppo, buying up every animal resaleable at a profit in Bombay. Purchases thus made at a distance are seldom brought into Baghdad for fear of attracting notice, but halted well outside the town, joined there in August or September by as many of the Baghdad selections as are fit for export and then marched rapidly and furtively out of the country for shipment at Muhamra. From all this it results:—(1) that Baghdad is not the market it ought to be in which to buy horses; and (2) the Ottoman Government, as already remarked, instead of being better able, because of the embargo, to obtain remounts, finds its supply all filched away from it and turned through secret channels in the direction of India. So much for trying to dam up a great trade.

As regards the Bombay markets, the dealers' great complaint is that the owners of commission stables not only over-charge them but too often induce them to sell on credit, and keep them waiting too long for their money. This is easier stated than remedied perhaps. Most horse-owners of the class referred to seem to think it better to sell on credit than not to sell at all; and owing to their ignorance, as a rule, of European ways, it is almost unavoidable that they should put themselves, when they reach Bombay, under the tutelage of some Arab, Persian, or at all events, Parsee stable-keeper able to act as a medium between them and buyers. At the same time if some one in Bombay could do for the importers of Arabians what has been done in Calcutta for those bringing over Australians, that is, open up to them a yard in which they could put up their horses on moderate terms, and where cash payments should be the rule, it seems probable that more horses would then be attracted to India than ever, and prices greatly fall.

## SECTION IV.

## CONCLUSION.

The following is a resumé, of the views which the present paper is considered, however feebly and imperfectly, to elucidate:—

- (1) The policy of the Porte touching export of horses is so arbitrary and uncertain, that it is highly necessary for the Government of India, in the military department, if the efficiency of its mounted branches is to be maintained on a sure basis, to make every possible effort for the enlargement and improvement of its indigenous horse-supply.
- (2) In so far as Arabian horses are to be used for this purpose, they should not be drawn from chance sources, but procured directly from where they exist in their true and perfect form, that is, the Bedouin tribes of Arabia, notably the Inizah: just as if, in some European country, it were desired to improve the local breeds by means of English thoroughbreds, such would naturally be sought for in England itself; and
- (3) The difficulties in the way of finding the right stamp of stallion of mature age among the Inizah being great, the Resident in Turkish Arabia should be instructed to buy yearlings of the high class required, and send round selections from them at the proper age, for the use of the Horse-breeding department.
- (4) The point should be considered whether it would not be possible to make things a little easier than at present for the people who bring over Arabians, whether grooms, agents or owners, when they arrive in Bombay.

BAHGDAD RESIDENCY, }  
March 1883. }

VII.  
MAKUM  
COAL MEASURES  
AND  
PETROLEUM SPRINGS.

BY

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PREFACE.

This report, or rather paper, is confined entirely to the Coal measures and Petroleum springs which have been discovered in Northern Assam, and treats more especially of the Makum Coal measures and Petroleum springs from a Geological point of view. The subject is divided into three parts, viz;—

- PART 1.—Introductory remarks on Coal measures generally.  
„ 2.—History of Coal and Petroleum discoveries in Upper Assam.  
„ 3.—Petroleum.

Part 1 is intended for the non-professional reader, to enable him to form some idea of the theory of coal formations and their economical uses; as also how and where to look for this mineral and others almost invariably associated with carboniferous formations.

Parts 2 and 3 explain themselves and require no remarks here.

A description of the means of communication by land and water, machinery and labour employed, etc., etc., will be embodied in a military report on the Assam Railway in course of preparation.

The materials for this paper have been derived from the following standard works and authorities.

- (a) “Geology and Mineralogy,” by the Very Rev. Wm. Buckland, D. D., F. R. S.; revised edition.
- (b) “Paper on the Coal fields in the Naga Hills, etc.,” by F. R. Mallet, F. G. S. Geological Survey of India.
- (c) “The three Kingdoms of Nature”, by the Rev. S. Houghton, F. R. S.
- (f) “The Study of the Rocks”, by Frank Rutley, F. G. S.
- (g) Robinson’s Assam.
- (h) Personal visits to the Mines and Petroleum springs; and notes made on the spot.

## PART I.

## INTRODUCTORY REMARKS ON COAL MEASURES GENERALLY.

Stratified rocks for the sake of convenience, are arranged as Primary, Transition, Secondary and Tertiary series.

Coal formations appear in the Transition series. In the inferior regions of this series plants are few in number; but in its superior regions the remains of land plants accumulated in prodigious quantities, and are preserved in a state which gives them a high and two-fold importance:—first, as illustrating the earliest vegetation that appeared upon the globe, the state of the climate and geological changes which then prevailed; secondly, as affecting in no small degree the actual condition of the human race.

The strata in which such a vast amount of vegetable remains have been collected are designated by the name of the Carboniferous Order, or Great Coal formation. It is in this formation chiefly that the remains of plants of a former world have been preserved and converted into beds of mineral Coal, having been transported to the bottoms of former seas and estuaries or lakes, and buried in beds of sand and mud, which have since been changed into sandstone and shale. But the origin of Coal

is, in many instances, referred to the growth of plants on the spot. In some Collieries of England, trees apparently *in situ* (Sigillaria) are frequently found erect. Below many beds of Coal is a peculiar kind of fire-clay, traversed by the roots and rootlets (called Stigmaria) of similar trees. The causes which collected these vegetables in beds thus piled above each other and separated by strata of vast thickness, composed of drifted sand and clay, receive illustration from the manner in which drifted timber from the existing forests of America is now accumulated in estuaries of the great rivers of that Continent, particularly in the estuaries of the Mississippi and on the Mackenzie River.

But the Carboniferous Order contains, besides Coal, subordinate beds of rich Argillaceous (*i.e.* partaking of the properties of clay) iron-ore, which the near position of the coal and limestone renders easy of reduction to a metallic state. Limestone abounds in the lower regions of the Carboniferous strata. Therefore, this formation which is capable of affording an almost unlimited supply of two such useful minerals as coal and iron, assumes a place of first importance among the sources of benefit to mankind.

The trees of the primeval forests have not, like modern trees, undergone decay, yielding back their elements to the soil and atmosphere by which they had been nourished; but treasured up in subterranean store-houses, have been transformed into enduring beds of coal, which in these later days or ages, have become to man, the sources of heat and light and wealth.

It is not unfrequent to find among cinders, traces of fossil plants, whose cavities having been filled up with silt at the time of their deposition in the vegetable mass that gave rise to the Coal, have left the impression of their forms upon clay and sand enclosed within them, as sharp as those received by a cast from the interior of a mould.

Mr. Hutton, however, has decided beyond a doubt the vegetable origin of coal of every description, even of the most perfect bituminous (mineral pitch) coal; he ascertained that if any variety of coal be cut into very thin slices and submitted to the microscope, more or less of vegetable structure can be recognised.

Coal, which is a mineral, flourished in the primeval forests and swamps in the form of gigantic Calamites, Lepidodendra, and Sigillariæ. Here they floated on the waters, until they sank saturated to the bottom, and being buried in the detritus of adjacent lands, became transferred to a new estate among the members of the mineral world. A long interment followed, during which a course of chemical changes and new combinations of their vegetable elements, have converted them into the mineral condition of coal. By the elevating force of subterranean fires these beds of coal have been uplifted from beneath the waters to a new position in the hills and mountains, where they are accessible to the

Physical forces applied to render coal strata accessible to man.

industry of man.

The most striking difference between the Tertiary and preceding periods is in the vegetables, which in the former abound in existing forms of Dicotyledonous plants and large trees, such as poplars, willows, elms, chestnuts, sycamores, and many other genera whose living species are familiar to the present generation of mankind. These accumulations of this description of vegetation form extensive beds of Lignite and Brown coal. In some parts this Brown coal occurs in strata 30 feet in thickness, chiefly composed of trees which have been drifted, apparently by fresh water, from their place of growth and spread forth in beds, usually alternating with sand and clay, at the bottom of the then existing lakes or estuaries. The trees in the Brown coal are not all parallel to the plane of the strata, but cross one another in all directions, like the drifted trees now accumulated in the alluvial plains and delta of the Mississippi; some of them are occasionally forced into a vertical position.

The Lignites of the Tertiary formations, occasionally present small deposits of compact and useful fuel, but they exert no important influence on the economical condition of mankind.

The great advantage of the carboniferous strata being disposed in Basins is, that the coal seams crop up all round the circumference of each Basin, and thus render them accessible; and mines can be sunk in almost every part of their respective areas. An uninterrupted inclination in one direction only would have soon plunged the lower strata to a depth inaccessible to man.

Carboniferous Strata—advantage of its disposition in basins.

Faults or Fractures are of great importance in facilitating the operations of Coal-mines. "The occurrence of Faults or Fractures. Faults and the *inclined position* in which the strata composing the Coal measures are usually laid out, are facts of the highest importance, as connected with the accessibility of their mineral contents. From their *inclined position*, the thin strata of Coal are worked with greater facility than if they had been horizontal ; but as this inclination has a tendency to plunge their lower extremities to a depth that would be inaccessible, a series of Faults, or Traps, is interposed, by which the component portions of the same formation are arranged in a series of successive tables, or stages, rising one behind another, and elevated continually upwards towards the surface, from their lowest points of depression. A similar effect is often produced by *undulations* or contortions of the strata, which give the united advantage of inclined position and of keeping near the surface. The *Basin-shaped* structure which so frequently occurs in Coal fields, has a tendency to produce the same beneficial consequences."

"But a still more important benefit results from the occurrence of *Faults* or *Fractures*, without which the contents of many deep and rich mines would have been inaccessible. Had the strata of Shale and Grit, that alternate with the Coal, been continuously united without fracture, the quantity of water that would have penetrated from the surrounding country into any considerable excavations that might be made in the porous grit beds, would have overcome all power of machinery that could profitably be applied to the drainage of a mine ; whereas, by the simple arrangement of a system of *Faults*, the water is admitted only in such quantities as are within control. Thus, the component strata of a Coal field are divided into insulated masses, or sheets of rock, of irregular form and area, not one of which is continuous in the same plane over any very large district ; but each is usually separated from its next adjacent mass by a dam of clay, impenetrable to water, and filling the fissure produced by the fracture which caused the Fault.

"These same Faults, also, whilst they prevent the water from flowing in excessive quantities in situations where it would be detrimental, are at the same time of the greatest service in converting it to purposes of utility, by creating on the surface a series of springs along the line of Fault, which often give notice of the Fracture that has taken place beneath." In fact these Faults guard the miner from inundation by a series of natural dams traversing the rocks in various directions, and intercepting all communication between that mass in which he is working and the adjacent masses on the other side of the flucan\* or dam.

Varieties of Coal.

The varieties of Coal that contain *bitumen* are the following :—

- (a) *Pitch, or Caking Coal*—burns with a yellow flame and requires frequent stirring to keep it from caking ; colour, velvet or greyish black.

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\* *Note*.—A term used in Cornwall for clay veins.

- (b) *Cherry Coal*—burns more rapidly than *pitch coal*, and being more brittle, breaks up readily so as to require less stirring.
- (c) *Splint Coal*—is a hard and dry kind of *cherry coal*, passing into *cannel coal*.
- (d) *Cannel Coal*—has a dark greyish black or brownish black colour, a large conchoidal fracture, and takes a good polish. It burns with a clear yellow flame without melting, and has been used as a substitute for candles, from which circumstance it derives its name.
- (e) *Jet*—resembles Cannel coal, but is blacker, and has a more brilliant lustre. It is found in detached pieces in clay. *Jet* was called *Gagas* by the ancients, from the name of a river in Lycia at the mouth of which it was found.

*Anthracite*.—This term expresses varieties of coal that do not contain bitumen. Coal consists principally of carbon, with more or less of bitumen, and a small quantity of silica and alumina, and sometimes peroxide of iron; potash and soda have been frequently found in it, and are, no doubt, the remains of the alkaline salts of the growing plants. *Anthracite* has a bright, submetallic lustre, iron black colour, often iridescent; it is opaque, and has a conchoidal fracture; no varieties of coal are called *Anthracite* that contain less than 90 per cent of pure carbon.

*Bitumen*.—This forms the chief distinction between *Coal* and *Anthracite*. Many different oily substances are included under the term *bitumen* of which the most important are *naphtha* and *asphalte*.

Animalcules of the genus *Gaillonella* secrete iron, which when connected with their siliceous shields, forms after death a nucleus to which other iron is attracted, from a solution of this metal in the water which these animals inhabit.

“Nummulitic” term used to express age of strata. The *Nummulite* is a fossil of a flattened form, resembling a small coin, and common in the early Tertiary period (derivation Latin *nummus*, a coin, Greek *lithos*, a stone.)

*Muriate of Soda*, or common salt, is extensively diffused throughout certain portions of the Secondary and Tertiary Strata, especially those of the new red-sandstone formation.

Is found in Coal measures, often in single imbedded crystals, but more frequently massive. It has a metallic lustre, and is of a bronze yellow to gold yellow colour; it has the following composition:—

|                      |     |     |    |     |                |
|----------------------|-----|-----|----|-----|----------------|
| Two atoms of Sulphur | ... | ... | 32 | ... | 53.3 per cent. |
| One do. Iron         | ... | ... | 28 | ... | 46.7 „         |
|                      |     |     | 60 |     | 100.0          |



It is often found in beds among slate rocks, and is also met with massive in lodes. It is used as an ore for sulphur, and employed largely in the manufacture of sulphuric acid.

Stratified rocks occur in beds or Strata, this arrangement has in the first instance been an approximately horizontal one, and, in most cases, where there is a marked deviation from horizontality, the deposits have been disturbed by the action of subterranean forces. When any such disturbance has taken place, so as to communicate an inclination to the bed, this inclination is then called the *dip*.

*Strike.* The *strike* is always an assumed horizontal direction. The *dip* is always reckoned at right angles to the *Strike*.

The market value of Coal is influenced by its external character. External characters. whether it is "hard" or "soft." The best hard Hard Coal. Coal is very homogeneous in structure, with little or no "cleat" and without apparent lamination planes. So capable is it of withstanding the weather that sometimes a seam of this variety forms a cliff on the hill-side, or obstruction in a river bed, from which the associated shale and sandstone have more or less weathered away. It is fresh and unweathered on faces that have been exposed for ages. No difference is apparent between a piece broken from the surface and one taken from the interior. It can be quarried in large blocks, which are firm and hard, and which can be stored for an indefinite time without injury.

Sometimes the hard coals display on the broken face a rather small cuboidal fracture, the sides of the cuboids being parallel and perpendicular to the plane of bedding. This variety is somewhat more tender than that in which no regular structure is apparent. There is a gradation from the hard to the soft coals, no hard line existing between them.

The soft coals are very tender at the outcrop. For some distance—  
*"Soft" Coal.* a few inches or feet—from the surface, they are weathered and sodden. The portion immediately below, which is often separated rather sharply from the sodden part, is very tender, so that most of it crumbles into slack or small coal, and what remains in lumps is too fragile to bear rough usage.

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## PART II.

### HISTORY OF COAL AND PETROLEUM DISCOVERIES IN UPPER ASSAM.

The existence of Coal in the Assam Valley, more especially in the portion termed Upper Assam, has been known for years; in fact ever since the British took possession of the country from the Burmese in 1824, or thereabouts; the latter were actually driven over the very hills where two seams of coal are now being worked by the Assam

Railway and Trading Company, viz: at Thikak and Ledo. Mr. Robinson in his work on Assam, published in 1841-42, remarks.—“The beds of limestone and coal are of very great extent; and if worked, there is every reason to suppose they will lead to very important results in the advancement of the country. The natives are yet ignorant of their value \* \* \* throughout Assam, the Coal is, generally speaking, of a tolerably fair quality, nor is there much variation in the quantity of carbon ascertained to exist in the productions of the several localities. Upon the whole its mean specific gravity is about 1.288 containing:—

|                               |     |     |                   |
|-------------------------------|-----|-----|-------------------|
| Mean volatile or other matter | ... | ... | 45.4              |
| Carbon                        | ... | ... | 50.4              |
| Ash                           | ... | ... | 5.2               |
|                               |     |     | <hr/> 100.0 <hr/> |

In the vicinity of some of the above mentioned coal fields, springs or wells of *petroleum* are not of rare occurrence. Oil springs have likewise been found but these are of small extent.”

The Naga coal fields occur at intervals along the lower ranges which form the southern border of the Lakhimpur and Sibsagar Districts; the distance from the Brahmaputra varying from 25 to 35 miles in a straight line, or from 40 to 150 miles by the lines of river carriage.

The first discoverer of Coal in Assam appears to have been Lient.

Lieutenant R. Wilcox, R. Wilcox, who went up the Disang River as far as Borhaut in April 1825. He remarked that the hills in the neighbourhood consisted of grey and yellow sand stone, and that coal was to be found at no great distance, but he gives no further details as to locality and mode of occurrence of the seam.

Again, on the occasion of another expedition, Lieutenant Wilcox traversed the Dehing River, and observed a seam of coal in the Buri Dehing and Supkong, near which place petroleum also rises to the surface. Proceeding further eastward, he observed a thin strata of coal alternating with blue clay in the sandstone rock, on the north bank of the Dehing, near Tumong Tikrang; but he does not appear to have brought away any specimens with him.

In 1828 Mr. D. Scott, Commissioner of the North-East Frontier,

Mr. C. A. Bruce, 1828. fitted out an expedition to work certain seams of coal cropping out in the lower ranges of hills through which the Saffrai River flows to join the Disang. These seams are situated in Lat. 26°45' N., Long 95°0.E. The expedition consisted of 100 men under the supervision of Mr. C. A. Bruce, a very enterprising man, who had been in command of a division of gun-boats on the Brahmaputra River during the operations against the Burmese in 1824. Mr. Bruce also discovered the existence of the tea-plant in Assam, which was developed into an industry by his brother, Mr. R. Bruce, with the assistance of the Government of the E. I. Company under Lord William Bentick in 1832-34. Mr. R. Bruce, was the first British

merchant who had ever penetrated so far eastward beyond our Eastern Frontier; he came to Assam in 1823, with a large assortment of goods for disposal.

This expedition under Mr. C. A. Bruce ascended the Disang River and its tributary the Saffrai River during the rains, and commenced operations on a seam which he calculated as being 36 feet in thickness, with but one thin parting of shale. Five thousand maunds were quarried and the boats laden with as much as they could carry; but such was the difficulty of navigation on account of the numerous bends, velocity of the stream and rapids, that four canoes were lost going down stream. The remaining boats arrived safely at the point on the Brahmaputra from whence they had started, and a boat load of coal was sent down to Calcutta, where it was pronounced to be equal to English coal and the best ever found in India.

Lower down the stream of the Saffrai, Mr. Bruce found eight other out-crops; he calculated two of these seams to be 18 feet and  $37\frac{1}{2}$  feet respectively, and proceeded to raise some of it, but being surface coal and much injured by weathering, it was found to be inferior to that quarried from the 36 feet seam.

Mr. Bruce also visited some low hills close by the river, where iron-ore was being extracted and smelted by the Assamese, the produce being worked up into dhaos (a kind of large knife) for barter with the Nagas for their produce, such as cotton, &c. Coal and clay ironstone were also found at Tiru-ghat; the Tiru is a tributary of the Saffrai River.

In 1837, Mr. Brodie picked up loose pieces of coal of good quality in the Nambhur River, a stream which joins the Dhausiri River some miles south of Golaghat, but the position of the bed was never ascertained.

Again, in 1837, Lieutenant Bigge and Dr. Griffith, while exploring the Namrup River about 9 miles E. S. E., from its junction with the Buri Dehing, discovered a very valuable seam of coal, the upper seam being about 3 feet in depth, the centre one 9 feet. They extracted some of the coal and took it down to their camp for trial, when it was found to be of extremely good quality, burning with a strong flame and giving out a very large amount of heat, but from the smell, containing a great quantity of sulphureous matter. It did not burn entirely away, but made a large portion of cinder and was a very valuable description of coal. Mr. Mallet remarks—"Some of the coal, in which the structure of the original wood was plainly visible, appears to have been Lignite and was most probably from fossil stems in the sub-Himalayan rocks."

Major White discovered several petroleum springs along the banks of the Namrup River.

During 1837-38, Captain Hannay examined the coal seams at Jaipur. On the 1st February 1837, he reported having found several out-crops and also noticed the occurrence of clay iron-ore, some of the masses of which required two men to lift. Captain Hannay raised altogether 1,050 maunds of

coal; 800 maunds of this he sent by boats to the mouth of the Dehing River and from thence 224 maunds were sent to Calcutta for trial and report. This coal was reported on unfavourably, being inferior to that sent by Mr. Bruce from the Saffrai out-crops and containing a considerable amount of sulphureous matter.

Also during 1837-38, Captain Jenkins sent exploring parties to search for the coal seams discovered by Lieutenant Wilcox on the banks of the Disang River. Captain Jenkins, 1837-38. The first seam met with was in the channel of the river, about a mile above the village of Borhaut, and calculated to be 8 feet in thickness; another was found about a quarter of a mile distant on the banks of a little water-course, and was traced at intervals for about 200 yards, throughout which distance it appeared to maintain a thickness of several feet. The coal in both these beds appeared to be of the first quality and favourably situated for working as well as for transport. Close to the second out-crop several small springs of petroleum were observed, from which the oil flowed into the pools in the water-course.

Fresh discoveries of coal were made in the Disang River by Lieutenant Brodie in 1839. Specimens were forwarded to Calcutta for examination and proved to be of good quality. In 1840, the Assam Tea Company intended to establish a quarry in this situation, with the intention of keeping a dépôt on the Brahmaputra at Dikhu-mukh supplied with the mineral. This Company appears to have been working the coal seams at Jaipur about this time. Lieut. Brodie, 1839.

In 1842, Mr. Landers, Special Assistant to the Commissioner, found two or three beds and worked one of them near the village of Namsang on account of Government; this seam was 6 feet in thickness. A further trial was made by the Assam Tea Company who raised 1,000 maunds of coal and tried it on board their Steamer. Mr. Smith, the Commander, pronounced it "the best he ever had on board a steamer, generating steam quicker without clinker,\* and far superior to any Calcutta Coal." Mr. Landers, 1842.

In the latter part of 1847, Major Hannay had two quarries at work on the opposite banks of the Dehing River at Jaipur. The seam is described as 16 feet thick, including 10 feet of Coal, and was traced to a distance of about 200 yards. Major Hannay, 1847.

In 1848, Mr. Thornton, Sub-Assistant Commissioner, was sent to the Dikhu valley to report on the practicability of supplying coal from thence for the use of the Government steamers. He appears to have seen one bed only which was being worked by a Native contractor, and which he describes as being 10 feet thick, including 3 or 4 feet of coal. This seam was situated on the brow of a hill 1400 feet high and distant  $2\frac{3}{4}$  miles from the coal dépôt on the river, with a hill 1,800 feet high intervening. Mr. J. Thornton, 1848.

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\* Note.—Scoville or refuse of a furnace.

In 1865, Mr. Medicott was deputed to visit and report on the coal-fields of Assam generally. He examined the Jaipur and Makum fields, and pointed out the advantages of the former with regard to position, in being actually on the banks of the river and below the rapids which exist some miles higher up stream, and he also noticed the probability of finding other seams below those visible at the surface. These advantages, however, he thought were outweighed by the superiority of the coal from the Makum field which he considered, judging from the evidence then available, to be the coal-field of Assam.

On the Namchik\* River, Mr. Medicott observed three thick beds of good coal within a length of section of 200 feet, and was of opinion that the Makum coal and that in the above-mentioned river, belonged beyond reasonable doubt, to the same band. The age of the coal he regarded as most probably *nummulitic*.

During recent years coal has been raised to some little extent, more especially in the Makum valley, by Mr. Hailey, Assam Tea Company.

Hailey, and in the Dakhu valley by the Assam Tea Company, but the out-turn has been very insignificant, and appears to have been only sufficient to enable the parties concerned to keep a lien on the property, which would otherwise lapse to Government.

Having reviewed briefly the history of the Makum coal measures. Assam coal fields, it will now be necessary to describe the measures known as the Makum coal fields, for the working of which the Assam Railway and Trading Company has been formed and a railroad, which will communicate direct with the mine, is in course of construction.

Mr. F. R. Mallet, F. G. S. Geological Survey of India, gives the following description of the Makum coal fields:—"The Makum coal-bearing area stretches along the outer-most range, or rather outer-most spurs of the hills to the south and east of the small fortified post of that name. The measures extend down to the base of the hills, and the northern surface boundary of the field is therefore the edge of the alluvium: I have already explained that the main Fault by which the Sub-Himalayan are brought against the coal rocks in all probability passes not far from the foot of the hills. To the south of the measures we have rock belonging to the Tipam and Disang groups. The extreme points at which coal has been actually found, then, are thirteen miles apart, but the probable total length of the field is some miles more. All the most valuable seams yet known or worked are included in the area between the Tirap and Namdang; west of the latter stream but little is known of the field."

"As is commonly the case, the hills conform in their longitudinal direction with the *strike* of the rocks, but they do not form a continuous ridge, being cut through by several streams. East of the Namdang their height above the plain is 1000 feet. The measures, as a whole, *dip* at rather high angles S. S. E. and consequently most of

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\* Note.—42 miles E. N. E. of Makum lies the Namchik coal field.

the known out-crops are on the northern side of the hills. The *dip* sometimes, however, is in the reverse direction."

The most easterly point to which the measures have been traced is S. E. of Kerimgaon, but they very probably extend as far as the end of the ridge where they would be cut off by the southern trend of the alluvium. In the opposite direction coal has been found in the Dirak Nadi, but between that point and the Disang I have no observations.

In a nullah close by the path from Kerimga on to Watto, Coal Out-crops—crops up in several places, and in an old quarry  
Tirap Quarries. the following section was observed.

|                              | <i>Ft.</i> | <i>In.</i> | <i>Ft.</i> | <i>In.</i> |
|------------------------------|------------|------------|------------|------------|
| Grey clunchy shale seen ...  | "          | "          | 3          | 6          |
| Carboniferous shale and coal | "          | 8          |            |            |
| Coal seen ... ..             | 6          | 8          |            |            |

Dip N. at 25°.

Another quarry further up stream.

|                        |   |   |   |   |
|------------------------|---|---|---|---|
| Grey shale seen ... .. | " | " | 2 | 0 |
| Carbonaceous shale...  | " | " | " | 6 |
| Coal seen ... ..       | 3 | " | " | " |

Dip N. E. at 20°.

The total thickness of coal exposed in this nullah is about 14 feet.

In a Nullah a little west of the above the following section is seen :—

|                                              | <i>Ft.</i> | <i>In.</i> | <i>Ft.</i> | <i>In.</i> |
|----------------------------------------------|------------|------------|------------|------------|
| Rather soft yellowish sand-stone seen ... .. | "          | "          | 11         | 0          |
| Grey shale ... ..                            | "          | "          | 1          | 0          |
| Blank ... ..                                 | "          | "          | 11         | 0          |
| Grey shale ... ..                            | "          | "          | 2          | 6          |
| Coal dipping E. 20° N at 5°                  | 9          | 0          |            |            |
| Blank ... ..                                 | 5          | 0?         |            |            |
| Brownish-grey shale ... ..                   | "          | 8          |            |            |
| Coal ... ..                                  | 2          | "          |            |            |
| Blank ... ..                                 | 15         | 0?         |            |            |
| Coal ... ..                                  | 2          | 0          |            |            |
| Blank ... ..                                 | 3          | 0          |            |            |
| Coal ... ..                                  | 5          | 0?         |            |            |
| Brownish-grey shale ... ..                   | 0          | 6          |            |            |
| Coal ... ..                                  | 0          | 4          |            |            |
| Blank ... ..                                 | 6          | 0          |            |            |
| Coal ... ..                                  | 10         | 0?         |            |            |
| <hr/>                                        |            |            |            |            |
| Total visible thickness of Coal              | 28         | 0?         |            |            |
| Do. do. Shale                                | 1          | 2?         |            |            |
| Blank do. do.                                | 29         | 0?         |            |            |
| <hr/>                                        |            |            |            |            |
| Total visible thickness of seam              | 58         | 6?         |            |            |

The 9 feet Coal was being quarried in 1874-75.

N. E. of Tikak. A few hundred yards N. E. of Tikak, on the northern slope of the hill, there is a section exposed comprising:—

|                                 | <i>Ft.</i> | <i>In.</i> |
|---------------------------------|------------|------------|
| Coal seen ... ..                | 6          | 0          |
| Blank... ..                     | 10         | 0          |
| Coal seen ... ..                | 9          | 6          |
|                                 |            | <hr/>      |
| Total visible thickness of seam | 15         | 6          |
| Blank ... ..                    | 10         | 0          |
|                                 |            | <hr/>      |
| Total visible thickness of seam | 25         | 6          |

Dip S. E. at 30°; coal of medium hardness. Elevation above the plain 750 feet.

West of Tikak.

In a Nullah just below and west of Tikak, the following section was laid bare by digging:—

|                                                                 | <i>Ft.</i> | <i>In.</i> | <i>Ft.</i> | <i>In.</i> |
|-----------------------------------------------------------------|------------|------------|------------|------------|
| Brownish Grey shale seen ...                                    | "          | "          | 1          | 0          |
| Coal... ..                                                      | 5          | 0          |            |            |
| Lenticular layer of carbonaceous limestone ... ..               | 0          | 6          |            |            |
| Coal... ..                                                      | 4          | 6          |            |            |
| Brownish Grey shale ... ..                                      | 9          | 0          |            |            |
| Coal with one or two thin partings of Carbonaceous shale ... .. | 13         | 0          |            |            |
| Carbonaceous shale seen ...                                     | 1          | 0          |            |            |
|                                                                 |            | <hr/>      |            |            |
| Total visible thickness of Coal                                 | 22         | 6          |            |            |
| Do. do. do. Carbonaceous shale ... ..                           | 1          | 0          |            |            |
| Do. do. do. Shale, &c. ...                                      | 9          | 6          |            |            |
|                                                                 |            | <hr/>      |            |            |
| Do. do. do. Seam ...                                            | 33         | 0          |            |            |

Dip S. 30° E. at 40°; coal of medium hardness. Elevation above the plain 900 feet. This Coal is very likely the same as that N. E. of Tikak.

The above sections will suffice to shew the nature of strata from which the coal is at this moment being quarried by the Assam Railway and Trading Company at Tikak and Ledo.

The following is a report by Mr. Paginini, Chief Engineer, superintending the construction of the Railway and working of the mines on the left bank of the Dehing River:—

Mr. Paginini's report on the Tikak and Ledo Collieries.

"The works in coal are concentrated in two spots, one is the Ledo colliery at the terminus of a branch of railway six miles long, starting

from Margherita Station and crossing the River Dehing by means of a wooden bridge of a span of 700 feet."

"The seams of this colliery are known as the *Lower seams*; they are three in number, parted by two strata of fire-clay of two and five feet thickness respectively. The thickness of the coal seams is six, eight, and twenty-five feet respectively. They extend from east to west and *dip* from south to north at an angle of 50°."

Ledo Colliery.

"For the immediate requirements of the trade, the Coal is extracted by means of quarries and levels near the surface; and for the purpose of permanent work two shafts are sunk to meet the coal at the depth of about 20 yards from the surface. The present out-put of this colliery is 200 tons per week, and it is expected that in six months the colliery will be capable of turning out 600 to 700 tons per week."

"The second colliery is the Tikak; it lies at the level of 600 feet above the railway branch south of the Dehing, and a mile from the same. This colliery will

Tikak Colliery.

be put in communication with the line by means of an inclined plane which will work by gravitation. The coal here lies in a direction S. S. W. and *dips* from W. N. W. to E. S. E. at an angle of 23°. It was originally thought that only one thick seam existed, but in working it it has turned out to be three seams parted by shale, one 35 feet thick, one 8 feet thick, and one 10 feet thick. The parting in one case is 3 feet thick, in another nearly 60 feet thick."

"The system of working this colliery is by means of levels at two different heights. On both grounds of working all tunnels will be symmetrical and will be put in communication wherever required for the purpose of ventilation. From these tunnels broad-face work will be established wherever necessary only limited by the demand for coal by the market. The present out-put of this mine is only 100 tons per week owing to the fact that all the labour is employed in extending the narrow works."

"The amount of coal get-at-able from the two mines without sinking below the level of the natural drainage, is estimated at upwards 40,000,000 of tons in the space comprised between the Namdang and Ledo rivers, without taking into account a series of seams known as the "Mallet seams" situated about 500 yards south of the Tikak colliery, and not yet touched by the Company. The total thickness of these seams is 40 feet, the thickest being about 20 feet."

"The Company has purchased machinery and is taking the necessary steps to ensure an out-put of 150,000 tons of coal per annum, to begin a year hence, such being the time supposed necessary to give full development to the works. The capacity of the mines is practically unlimited, as it would be a mere question of labour to turn out double or treble that quantity after the same period, should there be such a demand for coal."

"The colliery railway branch will be completed by the end of May, and by that time coal will be available to the public on the banks of the Dehing at Margherita three miles above Makum Fort."



"The bridge across the river and the Makum line, are expected to be finished probably next July, but the precise date of the junction of the rail with the Dibrughur and Sadia line will partly depend on the weather and on the speed with which the works are conducted on the Dibrughur side."

#### ECONOMIC GEOLOGY.

The amount of pyrites in the Assam coals varies considerably. Few, if any, of them are free from it, but its injurious effect in disintegrating the coal depends to some extent on its mode of occurrence. When segregated into nodules its action is less, both chemically and mechanically than when more minutely disseminated.

Nearly all the hard coals caked strongly in the crucible, yielding a firm, but sometimes tumid coke. The soft coals caked slightly, or not at all. The caking character of the Assam coal is a most important advantage, in rendering the utilisation of slack from the mines feasible, by its conversion into coke; and for steam purposes a mixture of coal and coke may be found preferable to the former used alone.

The following Assays have been made of the Upper Assam Coal :—

| No. of Assay. | SEAM—LOCALITY.                                 | Character of coal out-crop. | Fixed Carbon. | Volatile matter (exclusive of water). | Hygrosopic water. | Ash. | Caking properties. | Colour of Ash.                                        |
|---------------|------------------------------------------------|-----------------------------|---------------|---------------------------------------|-------------------|------|--------------------|-------------------------------------------------------|
|               |                                                |                             |               |                                       |                   |      |                    |                                                       |
|               |                                                |                             |               |                                       |                   |      |                    | Red.<br>do.<br>do.<br>do.<br>do.<br>do.<br>do.<br>do. |
| 1             | Makum Field.<br>9 feet band, Tirap Quarries... | Hard.                       | 60.7          | 34.8                                  | 2.2               | 2.3  | Cakes strongly.    | Red.                                                  |
| 2             | Seam S. E. of Leap, average                    | "                           | 54.2          | 34.6                                  | 3.4               | 7.8  | ditto.             | do.                                                   |
| 3             | 6 feet band N. E. of Tikak ...                 | Medium.                     | 61.2          | 36.2                                  | *                 | 2.6  | ditto.             | do.                                                   |
| 4             | 13 feet band W. of Tikak ...                   | "                           | 66.1          | 33.5                                  | *                 | .4   | ditto.             | do.                                                   |
| 5             | 11 feet 9 inches band Raining                  | "                           | 45.5          | 33.2                                  | *                 | 1.3  | ditto.             | do.                                                   |
| 6             | 4 feet seam Raining                            | Hard.                       | 57.0          | 37.8                                  | *                 | 5.2  | ditto.             | do.                                                   |
| 7             | 106 feet seam Namdang                          | "                           | 58.9          | 33.6                                  | 2.0               | 5.5  | ditto.             | do.                                                   |
|               |                                                |                             |               |                                       |                   |      | ...                | Greyish<br>white.                                     |

The principal iron ores found in the area under description are *Iron.* *clay iron-stones* from the Coal measures, and an impure *limonite* from the Sub-Himalayan strata. The former generally occurs in oblate nodules varying in size from that of a walnut to the bulk of a man's head, but lumps considerably larger than this also exist. When freshly broken the nodules have a light grey colour which changes after a time to a brown tint from the peroxidation of the iron. They are generally covered with a shell of hydrous oxide, from the character of which some idea can be gleaned as to the purity of the specimen. The ore is also found in thin bands inter-stratified with the shales and sandstones.

The following percentages of iron have been found in samples from different localities :—

| Percentage of Iron.                           |       |             |      |
|-----------------------------------------------|-------|-------------|------|
| Nodular clay-ironstone from near Tirugaon ... |       |             | 40.1 |
| Ditto                                         | ditto | Telpung ... | 32.2 |
| Ditto                                         | ditto | ditto ...   | 22.1 |
| Layer of clay-ironstone west of Telpung ...   |       |             | 23.6 |

Not unfrequently masses of a superficial ferruginous conglomerate or *breccia*, are found, where hydrous ferric oxide, deposited by water which has percolated through the ferriferous beds of the coal measures, has cemented gravel or angular fragments into a compact rock. Sometimes the oxide is tolerably free from foreign matter, and is sufficiently rich for use as an ore.

As to the quantity of ore, there is a large amount scattered throughout the measures, and enough is to be procured with little difficulty to keep any number of native furnaces going; but it is doubtful whether the supply obtainable in any one locality would be sufficient to feed an English blast-furnace.

The ore in the Sub-Himalayan beds is inexhaustible, but the quality is very poor, and the scarcity of lime-stone in the Naga Hills must always be a difficulty in the way of smelting operations on a large scale.

This is a hydrated peroxide of iron having the formula  $2 \text{Fe} \text{O}^{2/3}$ ,

*Limonite.*

$3 \text{H}_2 \text{O}$ . It is essentially a decomposition product, resulting from the alteration of protoxides, or of anhydrous peroxides of iron, which have previously existed as constituents of other minerals, or in the latter case sometimes simply as hematite itself. Limonite occurs in stalactitic, mammillated, pisolitic or earthy conditions. It is commonly blackish-brown or yellowish-brown. In thin sections of rocks it is often seen to occur forming pseudo-morphs after crystals of various ferruginous silicates, and as irregularly shaped blotches. It appears opaque under the microscope, or occasionally, in very thin sections, it is feebly translucent, and of a brownish colour.

The readiness with which some of the pyritous shales from the coal-measures exfoliate is very favourable to the rapid oxidation of the pyrites. Such shales could be used for the production of green vitriol and alum, and if any considerable quantity were incidentally raised in the course of mining for coal, it might be found possible to conduct the manufacture on profitable terms.

Limestone is very scarce amongst the rocks occurring in the area surveyed. Large nodules of impure, rather brittle, grey limestone are not unfrequently met with in the coal measures, and loose pieces are brought down by many of the streams. A specimen from the neighbourhood of Tel Pung yielded on analysis—

|                                                        |     |     |     |     |        |
|--------------------------------------------------------|-----|-----|-----|-----|--------|
| Calcic Carbonate                                       | ... | ... | ... | ... | 38.04  |
| Magnesian do.                                          | ... | ... | ... | ... | 21.75  |
| Ferrous Carbonate (with some $\text{Fe}^2\text{O}^3$ ) | ... | ... | ... | ... | 9.05   |
| Insoluble (mostly clay)                                | ... | ... | ... | ... | 32.00  |
|                                                        |     |     |     |     | <hr/>  |
|                                                        |     |     |     |     | 100.84 |
|                                                        |     |     |     |     | <hr/>  |

the rock being an argillaceous dolomitic limestone.

Another variety of limestone, which sometimes occurs in layers of a few inches or a foot thick amongst the shale, is of a greyish yellow colour and extremely tough. A sample from the 38 feet shales near Tel Pung gave—

|                                                        |     |     |     |     |        |
|--------------------------------------------------------|-----|-----|-----|-----|--------|
| Calcic Carbonate                                       | ... | ... | ... | ... | 41.80  |
| Magnesian do.                                          | ... | ... | ... | ... | 27.48  |
| Ferrous Carbonate (with some $\text{Fe}^2\text{O}^2$ ) | ... | ... | ... | ... | 9.51   |
| Insoluble (sand and clay)                              | ... | ... | ... | ... | 22.00  |
|                                                        |     |     |     |     | <hr/>  |
|                                                        |     |     |     |     | 100.79 |
|                                                        |     |     |     |     | <hr/>  |

The coal itself sometimes includes lenticular nodules of limestone which have a brown colour on account of the carbonaceous matter they contain, but they are often intersected by thin seams of colorless calspar. They seldom exceed a foot in thickness and a yard or two in diameter. A sample from the 6 feet 9 inches seam of coal in the Tiru nadi yielded on analysis—

|                                 |     |     |     |     |       |
|---------------------------------|-----|-----|-----|-----|-------|
| Calcic Carbonate                | ... | ... | ... | ... | 76.29 |
| Magnesian Do.                   | ... | ... | ... | ... | 15.94 |
| Ferrous Do.                     | ... | ... | ... | ... | 1.00  |
| Carbonaceous matter             | ... | ... | ... | ... | 6.00  |
| Insoluble incombustible residue | ... | ... | ... | ... | .80   |
|                                 |     |     |     |     | <hr/> |
|                                 |     |     |     |     | 99.94 |
|                                 |     |     |     |     | <hr/> |

The limestone from the Coal seams is easily burnt on account of the carbonaceous matter it contains and the resulting lime is white and slakes rapidly. But the supply of either kind is very trifling.

### PART III.

#### PETROLEUM.

The following is a list of localities where *Petroleum* has been observed, together with the names of the discoverers.

- (1). Lieutenant Wilcox discovered *petroleum* in the bed of the Buri Dehing at Súpkong near the out-crop of a seam of coal.  
Lieut. Wilcox, 1825-28.
- (2). Major White discovered *petroleum* in the Namrup river below the out-crop of seams of coal.  
Major White, 1837.
- (3). At Namchick Pathár, near the mouth of the Namchik river, Captain Hannay observed *petroleum* close to where a seam of coal crosses the bed of the stream.  
Captain Hannay.
- (4). *Petroleum* rises in at least two spots on the bank of the Namdang (Makum field), a little below its exit from the hills.
- (5). Springs also occur at the debouchure of the Makum nadi from the hills. When Mr. Medlicott visited these, the discharge of gas was so copious and continuous that when lighted it flamed almost without intermission, but the discharge of petroleum was inconsiderable.
- (6). At a place called Bapu or Babu Bor Pung, there is a superficial deposit of earthy bitumen, evidently resulting from the saturation of the soil with petroleum and inspissation of oil.
- (7). On the Revenue Survey Maps several "pungs" are marked along the western side of the Tipam range near Chapatoli.
- (8). Close to the Hukanjuri path, about 2 miles from Jaipur, petroleum exudes from the bank of a nullah.
- (9). There are at least 2 springs in a nullah half a mile north of the Disang.
- (10). Captain Jenkins mentions several springs about a quarter of a mile from the Disang.  
Captain Jenkins, 1837-38.
- (11). On the bank of the Teok, near the faulted junction between the Sub-Himalayan sandstones and the Disang group, there is a spot where the former are impregnated with *petroleum*. The Coal measures are in all probability below the surface here.
- (12). Mr. Bruce mentions oil-springs on the bank of the Saffrai.  
Mr. C. A. Bruce, 1828.
- (13). Some 3 or 4 miles to the south of Tirugaon, *petroleum* exudes in small quantities from the Sub-Himalayan sandstones.
- (14). At the head of the Tiru, Mr. Mallet observed *petroleum* oozing from the coal-rocks in four or five places.  
Mr. Mallet, 1874.  
Where it is most plentiful it issues from a rather massive sandstone dipping W. 40° N. at 80°.

(15.) At Tel Pung, on the Dikhu, a band of fine grained, massively-bedded sandstone, similar to that in the Tiru, strikes across the river, dipping W.  $16^{\circ}$  S at  $80^{\circ}$ .

(16.) Petroleum slowly exudes from between the cracks in the coal of the 2' 11" seam in the Hil Ján.

(17.) Two or three hundred yards lower down-stream than the 1' 4" seam in the Desai Valley, petroleum rises from the bed of the nullah in small quantities.

Marsh gas is a frequent accompaniment of the oil, and there may be a connection between the latter and the saline springs which were formerly utilized by the Assamese for the production of salt at Borhat, Jaipur and elsewhere. The association of petroleum and salt or saline springs is very common.

Mr. Paginini's Report, 1883. Report by Mr. Paginini, C. E. Assam Railway and Trading Company:—

"There are several *petroleum* springs in the Makum district, south and north of the Dehing; but the two most important are those on the Namdang River and on the Makum *pani*. The former is about  $3\frac{1}{2}$  miles up the Namdang river from the Dehing, and is yet untouched. The spring on the Makum *pani* has been tapped by the "Assam Mineral Oil Co." some years ago by means of two tube wells, one 230 feet deep the other 250 feet in depth."

"The Assam Railway and Trading Company has lately purchased the rights of the former Company, and is making a very limited use of this oil as an antiseptic. Owing to the low price of American oil it is now impossible to compete with that market were the Assam oil to be distilled. Moreover, this latter is poorer in illuminating power than the American. A field which is open to the Assam oil, in its crude state, is for pickling timber, for which purpose it answers admirably, and eventually for lubricating purposes if mixed with denser fatty materials."

DIBRUGHUR, }  
4th May 1883. }



# MAP

## SHOWING THE

### MAKUM COAL MEASURES.

SCALE OF MILES

Furlongs 0 1 2 3 4 5 6 7 8 Miles.

#### EXPLANATORY

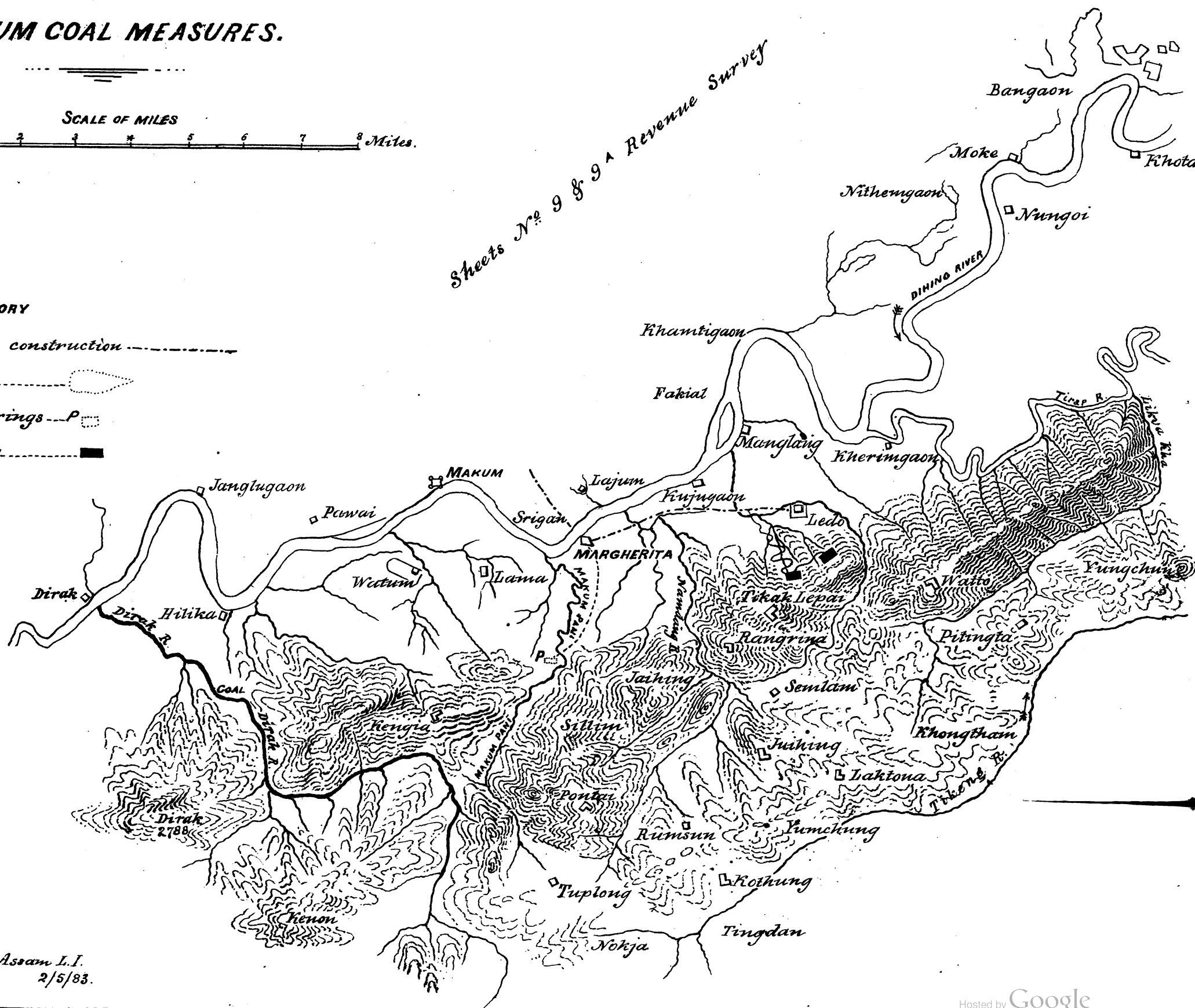
Railway under construction -----

Coal Measures -----

Petroleum Springs P

Mines working -----

Sheets No 9 & 9A Revenue Survey



A.K. Abbott, Captain.  
W.O. 42<sup>nd</sup> Regt Assam L.I.  
2/5/83.









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# ORIGINAL PAPERS.

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## I.

### THE VOLUNTEER FORCE OF INDIA— ITS PRESENT AND FUTURE:

BY

MAJOR E. H. H. COLLEN,

*Bengal Staff Corps,*

*Officiating Deputy Secretary to the Government of India,  
Military Department,*

*Gold Medallist of the Royal Artillery Institution.*

*"Mars gravior sub pace latet."*

#### PRIZE ESSAY OF 1882-83.

The spectacle presented by the British dominion over the continent of India is allowed to be unique in the history of the world. A handful of Englishmen, the heirs of the possession won by the "Merchants trading to the East," rule over many millions of people inhabiting an area of half a million square miles, equal to the whole of Europe without Russia.

British dominion  
over India.

The English ~~military~~ garrison which supports this rule is about equal to two of the army corps of Germany, while a native force drawn from the conquered races assists the alien army to maintain order or to embark in military adventure. The early romance attaching to the fabled splendours and riches of India, the marvellous history descending from mythic times of the waves of invasion which poured from the uplands of Central Asia over the country, the brief but wonderful record of our own settlement in the East, and of our conquest of a vast continent, combine to present to all Englishmen a study of deep interest. But when it is felt that this study is but a preparation to the practical problem in which England possesses a vital concern, when one of the questions of the day calling for reply is how to keep the India we have won, then it may be accepted that the subject of our power and position in India cannot be exceeded in interest.

India—a study of  
deep interest.

The Indian questions of the day.

Great questions occupy the thoughts and engross the attention of the statesmen whose labors are devoted to India. The land has passed the stage when the efforts of the administrator are mainly applied to the protection of life and property and to the opening up of the country. In the security of British rule an immense and fertile population increases and multiplies. The economic problem of the day is how this host is to be fed, and how the plenty of one province can be made to provide for the poverty of another. The fostering of the arts and industries of India; the development of the old industries and the creation of new ones; the equalisation of the burden of taxation throughout the Empire; the search for new sources of revenue or fresh economies in the expenditure; the intricate problems of currency and exchange; the protection of the country from famine; the development of railways and irrigation works as protective measures; the education of the masses and the extension of municipal institutions; in these and other questions the labors of those who work for the public weal are conspicuous.

These questions of great importance, but that of the military power should be paramount.

These subjects are and must be attractive to the rulers of India. The people must be fed, and India must pay her way. But this, although a practical aspect of the question, is, it may be said, a comparatively low view to take. The higher welfare of the people and their education, the greater share to be given to the natives of the country in its administration, are all matters which claim and receive a large share of attention. But to many minds there rise up in this path of benevolent enterprise the memories of the past; and to those the spectres of mutiny and rebellion seem to stand in the way, warning us to recollect the nature and number of the governed peoples and their easily developed discontent or hostility, to remember the vast extent of our possessions and the elements of disturbance within and without the frontier, and bidding us not to trust overmuch in our schemes for good. They recall the words of one\* who possessed great experience and statesmanlike power, who half a century ago wrote, that in all plans for the government of our Eastern Empire the military strength must ever be the primary consideration. "That Empire," he said, "has been acquired and must be maintained by the sword. It has no foundation, and is not capable of having any made that can divest it of this

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\* General Sir John Malcolm, G.C.B., in 1832.

character. We may by good government diminish the elements of sedition, and in a degree disarm the hostility of Asiatic Princes, but we never can expect active support in the hour of danger from the mass of the population of India. A passive allegiance is all these will ever give to their foreign masters; and even this allegiance, the more they become enlightened and are imbued with the feelings our intercourse must impart, will become more uncertain. It is therefore to the army of India we must look for the means we possess, not only of maintaining our power, but of preserving the great benefits we have already conferred, or may hereafter confer, upon the millions subject to our authority. No consideration, therefore, should ever induce us to forget for one moment the paramount and vital importance of our military power."

Just laws and good government will tend to make a people subject to them contented, but in a country like India, where the elements of disturbance and conflicting interests must always exist, the maintenance of order must be the first object of the paramount power; for this order forms the basis of all law, and without it no country can be governed. With all the safeguards we may impose, an army, however loyal and well-disciplined, recruited from a population governed by aliens, can never be entirely free from the possibility of military revolt, instances of which have not been infrequent in the history of India. However we may endeavour to secure the loyalty of the people, not only by just and good government of the masses, but by attaching to us the great chieftains of the land, our very existence in the country must, in the nature of things, involve the possibility of attempts to disturb our power, whether the efforts springs from an outburst of fanaticism, from some great upheaval of the condition of the masses, or from that desire for power which is ever inherent in human beings.

It may then be admitted that an investigation of the present and the possible future condition of a daily increasing element in our military power,—the volunteer force of India,—is a subject of interest and importance.

The causes which have led to the rise and development of the volunteer force in India are different from those upon which the formation of the great army of volunteers in England has been founded. In England, the knowledge that the strength of the regular army is limited, and that it is unwise to trust entirely to it and to the naval power, the belief in

Our existence in the country involves possible disturbance.

Investigation of the condition of the volunteer force important.

Difference in causes leading to volunteer movement in England and in India.



the possibility of designs of invasion, have led to the establishment of a military force which, after passing through long years of discouragement, has gradually been trained until it has become a potent element in the problem of home defence. In India the whole existence of the volunteers depends upon the fact that we stand in this country a handful of men surrounded by those to whom we are aliens. The British army in India, although adequate, in these days of quick locomotion by railway, to the task of maintaining order in India, is not more than sufficient for the purpose; and if, from any cause, a portion of it were withdrawn in some pressing need, there might be danger lest peace should be disturbed, even for a short time. The disturbers of order and the peace of India might find an opportunity were England engaged in a campaign beyond India or in Europe, and the consequences of the breaking of the peace of a province for a single day are too far-reaching to permit us to throw away a chance of preventing such an occurrence. England would put forth her strength, thousands of troops would be poured into the country, and the rebellion would be crushed, but years would pass before the evil results would be obliterated.

The British army cannot protect all points.

Then, again, the necessities of the strategical distribution of troops destined to act in bodies, can never permit the minute dispersion of the British army in India over the huge territory it garrisons. The main arsenals, the great cities, and the long lines of railway communication, must ever be the chief objects in the distribution of that army. Outlying stations and districts, still isolated or comparatively inaccessible, can rarely receive the strength which a British garrison confers, while a disturbance at a single one of such stations might lead to the conflagration of a district.

The development of British power.

When the first settlements of the British power were made and consolidated in India an European population scarcely existed. The writers and factors who were charged with the commercial responsibilities of the company of merchants trading to the East were too few in number to add much to the military power of the factories. Here and there they banded themselves together for the defence of those tiny posts which have now multiplied into the hundreds of civil and military stations representing the strongholds of British power throughout India, but no organisation with such weak materials could form any real factor in the military problem. To recount how the tide of British conquest swept steadily and surely over the land would

be to recount the history of British India, and of those great and beneficial changes the establishment of that empire has brought about. But even since the days when Lord Dalhousie, in 1854, nearly thirty years ago, prompted and sanctioned the formation of the first volunteer corps, a great change has come over the land. India has become a field of European enterprise; thousands of Europeans have settled in the country, and have added to the class of those whose European descent entitles them to be regarded as our fellow-countrymen; railways traverse the country through its length and breadth; the journeys formerly interminable, and occupying many months, now occupy but a few days; great public works for the benefit of the population have been carried out; and the whole aspect of the country may be said to be changed. And India is both weaker and stronger than in the days of the great Governor-General. We are weaker, because we have now vaster interests and a larger European population to protect, because the social condition of the people is undergoing change, and that the "dawn of liberty," as it is styled by a statesman of the new school, in a country the greater part of which, since the wave of the Aryan race passed over it, has been subject to foreign power, may only herald a troubled and tempestuous day. We are stronger, because we have no longer an immense native army which requires watching, our arsenals and artillery are no longer in the hands of native troops,—stronger because the extension of communications enables us to reinforce India, and to strike more quickly at any point, and to convey our troops rapidly over long distances; and that the advance in warlike science and skill must ever give the advantage to those who hold the reins of knowledge. We are stronger with a strength which far overbalances the weight of weakness because the European army has been increased, and the European population, capable of fighting, has expanded so as to become a real power.

The lessons of the mutiny of 1857 have indeed not been entirely forgotten. In most of the stations inhabited by Europeans in India it would no longer be possible for mutineers, aided by the criminal population of the country, to take their vengeance on helpless women and children. Those who have read the story of the great rebellion, or who were actors in the suppression of it, can bear witness to the statement that, even with the small number of the European population of those days, the want of the organisation of

The lessons of the mutiny of 1857.

the material and of a little timely preparation led in many cases to those frightful scenes from whose memories we are hardly free, while they will equally join in pointing to those conspicuous examples where the organisation of defence enabled Englishmen and those of English blood, assisted by a few loyal natives, to stand out against masses of trained soldiers using their arms against those masters by whom they had been taught to wield them. The lessons to be learned,—and those who run may read,—are recorded in history. If they are referred to here, it is for the purpose of enforcing the moral which hangs upon them, and in order to insist upon the necessity that under no circumstances shall there ever be a repetition of those miserable scenes.

India at the time of the mutiny, and the rise of the volunteer movement.

It is hardly possible for the present generation to picture to themselves the state of things which existed prior to the mutiny of 1857. When the first volunteer corps for the Straits Settlements, then under the Government of India, was proposed, there was but one European regiment stationed on the long line of 800 miles from Calcutta to Agra, and the European force in India was altogether weak. A great army mutinied, the police mostly joined in revolt, the criminal population of the large cities and towns swelled the ranks, and many of the native aristocracy contributed actively, or in a secret manner, to the rebellion. Provinces appeared then to be wrested from our hands; over large tracts of country the British power had practically ceased to exist; and except at isolated points its flag was no longer flown from the Nerbudda to the Sutlej. On the 4th of July 1857 the Government of India wrote to the Court of Directors that "the Bengal Native army was in mutiny; the North-Western Provinces were for the moment lost; the King of Delhi and our treacherous sepoys were proclaiming a new empire; small bodies of gallant Englishmen were holding out in isolated places against fearful odds; revolt was still extending; and the hearts of all Englishmen in India were daily torn by accounts of massacre, and worse than massacre, of their women and children." Lord Canning had written in June—"It is enough to break one's heart to have to refuse the imploring prayers of the Europeans at different stations for the protection of English troops against the rising of the sepoys in the neighbourhood, or against the savage marauders or mutineers who are afoot; but to scatter our small force over the country would be to throw away every chance of a speedy success." The offer of the European inhabi-

tants of Calcutta to enrol themselves in volunteer corps had been refused, but it was subsequently accepted, and the Calcutta volunteer guards of artillery, cavalry, and infantry were formed. It is of course difficult to say how far the Government of those days were right in endeavouring to sustain public confidence in the stability of British rule without extraordinary measures. But one thing is certain, that had a large and well organised volunteer force existed in Calcutta, such as it could even then have furnished, the 53rd Foot at Fort William and the 84th Foot at Chinsurah might have been set free to proceed to the scene of rebellion. Volunteers and militia were formed in various parts of the country wherever there were sufficient numbers for enrolment, and the Madras volunteer guards sprang into existence. The volunteer horse, and those militia and volunteers enrolled at Agra, Allahabad, and Lucknow, did excellent and loyal service. Lucknow has been called the "Plevna" of India, and the defence of Lucknow, due to the precautions taken and the preparations made by Sir Henry Lawrence and to the resolute gallantry of the soldiers, volunteers, and loyal natives who for five months held at bay masses of regular troops, is not only one of the greatest and noblest incidents of the mutiny campaign, but serves as an example of what timely preparation can do, and what a few Englishmen can effect against the heaviest odds. The defence of Arrah, eminently an example of what can be done by organisation and preparation, is also written in the history of those times; and in the darker pages of history is written the cruel disasters which befel Englishmen and Englishwomen for the want, in too many cases, of the organisation of defence.

The value of the volunteer movement in India has at last come to be fully acknowledged. It is acknowledged that we as Englishmen, living in a land surrounded by those who can never be trusted as our fellow-countrymen, must be prepared to take every means in our power to ensure the maintenance of order and the safety and security of those who must be protected in time of need; and if the materials of strength have developed within the last twenty years, it must be recollected that a great increase has also taken place in that portion of the European population and in property which must be effectually protected in time of popular disturbance or of military revolt; and that it behoves us, so to organise our strength that no element of security which we possess shall be left out of the

Value and necessity of volunteer movement.

calculation. We have a large force of British troops in this country, but in time of trouble great and innumerable calls would be made on that reservoir of power. With an enormous frontier to defend from the irruption of savage tribes, with large bodies of armed men in the service of the Native Princes and the chieftains of India, which as the paramount power we must watch and control, and with a vast population composed of different races, religions, and languages, it must ever be our aim to make the British army in India, or at least the larger portion of it, a mobile and field army in the most complete sense.

The auxiliary power given to the British army by the volunteers.

A great part of that army must indeed remain to garrison the great political, strategical, and commercial centres, upon the possession of which, with their communications, the safety of the empire must depend. But the largest portion of the force must be placed in the field, either to crush insurrection, or to oppose such organised military bodies as might be brought against us. In outlying stations, in those minor centres of the civil power, and on the long lines of communication by road and railway, the secure possession of which is absolutely necessary to the tranquillity of the country and to the maintenance of our power, the lives of our countrymen and countrywomen, and the untold amount of public and private property scattered throughout the land, must remain either inadequately defended or must take from the field army a large and valuable portion of its strength. The formation of volunteer corps at every place where there are European residents, few or many, must therefore be a real increase to the military strength of the empire, for not only would they, in time of trouble, enable the main body of the British troops to be set free for service in the field, but in those places where British troops are not ordinarily stationed, they would be still more valuable. They would there act in maintaining order in the station or district by their mere existence, and would prevent, not only the disasters and evils attendant on any interruption of the peace of the country, but, in case of heavier troubles, would form a protection, aided by defensive measures, to the non-combatant population and to public and private property, which might be sacrificed in the absence of an armed and organised body, without that succour reaching them which a defence would enable them to await.

Organisation must not be postponed till the danger comes.

In India, more than in any other country, time is everything in military operations. A few hours' delay in quelling a mutiny or insurrection may be perilous to

the cause of order. In India there is no time to organise when the danger comes, and the minds of men in power are bent in postponing, if possible, the evil hour. Hence we should be able to secure the safety of all important points by means of the European inhabitants organised as military bodies, aided by small detachments of regular troops, while the larger portion of the latter could be formed into moveable columns, whose mobility should be a terror to their enemies, and who might thus keep a whole province quiet or a long line of communication intact. There are those who say we cannot take extensive military precautions when the danger, if it ever comes, may be far distant. But in India, when the danger does come, it gives no long warning of its approach, and hurried attempts to organise our strength may precipitate the evil. The acutest and the most trusted observers, whether they be official or non-official, have no prophetic vision enabling them to look into the future. The mutiny of 1857 burst upon the Government and the community, and found them absolutely unprepared. Officials, whether military or civil, even men like John Lawrence, intimately acquainted with the native character, joined in persuading themselves and the Government that there was no danger at hand.

These, then, are some of the considerations, aided by the experience of the past, which appear to warrant the conclusion that all would welcome an addition to the military strength of the empire, such as would be afforded by a larger development of the present volunteer force of India. But there are other considerations, and which are now widely appreciated, arising from the benefits conferred upon the volunteers themselves by the training they receive. The inculcation of habits of military discipline, the knowledge that he is acting with others for the common weal, the greater pride which a man is likely to take in himself, and the sacrifices which he has to make, all tend to create in a volunteer some improvement of the moral condition. And from the physical point of view, a training in military exercises and the use of the weapons with which he is entrusted is in itself a physical education. Nor should the social advantages be entirely overlooked, for the volunteer movement promotes good fellowship, and brings together those who would not otherwise meet; it softens the prejudices of social caste or position, and enlivens the dreariness of many of those Indian stations in which large numbers of our fellow-countrymen and countrywomen have to spend the best part of their lives.

Moral and physical advantages of volunteering.

The two main questions,—increase in number and improvement in efficiency.

Strength of volunteers in India.

Numbers and qualities of the Europeans and Eurasians in India.

It may then be conceded that it is of real advantage and importance to the State to answer the two main questions—*1stly*, how the numbers of the volunteers in India can be increased; *2ndly*, how their efficiency can be improved.

In considering the first question, it is necessary to describe the present condition of the volunteer forces of India, and to compare their present strength with the numbers which may be expected to be produced by an expansion of the force. And first then we must consider what are the materials from which our volunteers in India can be drawn,—whether they are capable of being moulded into fitting shape, and whether sufficient numbers of the European civil population exist to place the strength of the force on a higher footing. Now as to the strength and distribution of the volunteers in India, these are most appropriately given in the tabular statement contained in the appendix. From this it will be seen that in the various provinces of India there are about 12,213 volunteers enrolled, of whom 9,421 are efficient, in which number are included the railway corps, numbering about 3,380 enrolled and 3,014 efficient.

The first step in any investigation which may be made to compare the strength of the volunteer force in India with the population from which it is drawn is obviously to gain a knowledge of the number of males capable of bearing arms, and of the conditions under which they live. But this, unfortunately, is an object which cannot easily be attained. Looking first to the numbers only, and referring to the memorandum on the census of British India of 1871-72, presented to Parliament in 1875, it is there stated that, “of those who profess the Christian religion throughout India, some 250,000 appear to be Europeans or to have European blood in their veins,” and, according to the census, there were in that year about 120,000 pure Europeans in the country including women and children, so that, deducting the number of British troops, there would be, in round numbers, about 60,000 Europeans of all kinds—men, women and children. Of the mixed races of British India, classified according to nationality, we are told that there were about 63,685 Eurasians, 30,272 Indo-Portuguese and 14,445 other races, making up a total of 108,402 of mixed races, including women and children. Of the last census we have unfortunately no complete account at present; some provincial reports have been published, but they do not in all respects furnish the information desired

for our purpose. But from such information as can be obtained, it would appear that there are, exclusive of the army, about 46,000 males who come under the designation of "British-born and other Europeans," while of the Eurasians there are about 31,000 males, giving a total, therefore, of 77,000 male Europeans and Eurasians, including children, in the whole of India. Now, even deducting a percentage for children and old men, it is apparent that there is a large reservoir of power in the number of men returned as "British-born and other Europeans." Of this class it is unnecessary to say more than that their physical and military qualities are, as a rule, all that can be desired for a military force, combining as they do the physical and moral characteristics of their race, with a high degree of intelligence, springing, not only from the education they may have received, but from the employments in which they are engaged. With regard to the other classes it is not so easy to speak, for although a very large proportion possess many of the physical, mental, and moral attributes of the race with which they are chiefly allied, it cannot be gainsaid that many of them have not, in so high a degree, the physical qualities which distinguish the parent race. On the other hand, if their physique is not as stalwart as those of unmixed blood, they are possessed of the great advantages of a temperate habit of body and an ability to bear exposure, qualities in which those not born in the country are sometimes deficient. They are, too, of the same religion as the parent race; their loyalty is conspicuous; and they have proved that they possess the courage which under the training of discipline constitutes the chief quality of an efficient soldier. The battle of Plassey, which established British power in India, was fought by Clive with some 1,100 Europeans, of whom 200 were Eurasians and Portuguese, and 2,100 Natives. A force which overcame an enemy of 35,000 Infantry and 15,000 Pathan Cavalry with 53 guns, achieved a victory which fully demonstrated, at least for India, the truth of Montaigne's saying, that it is not the number of men but the number of good men which gives the advantage.

The history and condition of these classes claim some brief remarks. The Portuguese settlers mixing and inter-marrying with the native population left a large number of descendants, who, as years went on, entered the British service, scattered over the country, and inter-married with pure Europeans. The French and Dutch descendants of pure and mixed blood

History and condition of the Eurasian community.



amalgamated with this class, the numbers of which were increased by the offspring of Englishmen and the women of the country. Pensioners settled in India, and the development of European enterprise bringing large numbers of Europeans to India whose children are born and settled in the country, thus farther added to the strength of what may be broadly called the European community of India. There are, therefore, domiciled Europeans, the descendants of pure blood, and the descendants of mixed blood. The last class comprise those of whom Lord Canning spoke when he said that they had a special claim upon us, the presence of a British Government having called them into being. Those who desire to investigate the history of this class must turn to the records of what has been termed "The Eurasian movement of 1829-30," when, after considerable pressure, certain legal disabilities were removed which had gradually surrounded the community from the end of the last century. And, although it is not possible in this paper to trace at length the history of this portion of our fellow-subjects, the question of their physical, mental, and social condition has so great a bearing upon the military strength of the whole European community, that it may be permissible to quote the words of Archdeacon Baly, who has done more than any other man to bring forward the claims of the European and Eurasian community to the advantages which education for their children must give them, and to the possibility of training them to useful careers. He says—"The European youths born and bred in the country \* \* \* are as strictly bound to the country and a part of its population as any section of its native population; that they are the descendants and children of soldiers, civilians, and mechanics, who have been or still are necessary to its administration or prosperity; and that if no room is found in it for their suitable and productive employment, a supply of wasters must accumulate annually, who will prey upon society as beggars, paupers, and criminals, and eventually lay a heavier charge upon its Government than any expenditure now incurred in training them for, or providing them with, employment."

Necessity for enhancing the strength of the community in the organisation of the organ defence.

Education and the provision of suitable openings in life will do much to raise the physical qualities and the social position of the community. Their loyalty is undoubted; they are of the same blood and religion as ourselves; and in all the habits and customs of life they assimilate to us. It is time, then, that we should

look to these men for the practical support of British rule, and endeavour to enlist them in any scheme for ensuring the safety of the British Empire in India. In the days of trouble we turned to them for help, and they did not fail us; and when we look back to the records of the Mutiny, we find conspicuous examples of fidelity, loyalty, and courage, whether we look to the heroic examples to be found in the defence of Lucknow, Arrah, and other places, or in the more numerous instances in which they fell gallantly fighting with us against the common enemy.

It may therefore be assumed that the classes from which volunteers can be drawn are capable of furnishing an efficient military force for local defence, and that the number of volunteers in India, as given in the tabular statement in the appendix, does not adequately represent the population from which they are taken. Now, although unfortunately we have no complete information regarding all the provinces of India, it will be useful if we take one or two examples to illustrate the position. According to the last census, there are 10,051 male Europeans\* in the city of Calcutta, and 4,740 males returned as Eurasians; and although a portion of the former class might, perhaps, be classified under the latter head, if we adhere to distinctions which it is desirable to remove, we have, deducting the strength of the British garrison of Fort William, an European population of over 13,500 males; of that the volunteers number only about 1,000,—a result which is quite inadequate when it is considered what additional military strength would be given if only 50 per cent. of the male European population of Calcutta were enrolled in a local defensive organisation. In Bombay city, the census records that there are 11,619 European and Eurasian males, of whom the greatest portion have returned themselves as Europeans; and, deducting the British garrison of Bombay and those in military employ, we have a strength of European population of over 10,000. Then take another example, that of British Burmah, one of the richest provinces of the Empire, a country in which it is peculiarly desirable to have a strong local defensive force, it is found that there are 8,202 male Europeans† and Eurasians, of whom by far the greater majority have returned themselves as Europeans. Deducting the British garrison of that province, we have about 6,700 males, of whom a large proportion are capable of bearing arms for the

Examples showing that the volunteers do not represent the whole strength of the European community in India.

\* Americans and Australians excluded.

† Excluding "other Europeans and Americans."

maintenance of order and the defence of the province. It may be concluded from these examples that returns from other cities and provinces will show a similar disproportion between the strength of the male European population and that of the volunteers.

Measures to increase the strength of volunteers.

We have now to consider the measures which are necessary to increase the strength of the volunteer force in India. The necessity for its existence has been proved, and needs no further demonstration, while it must be allowed that it does not represent in numbers the strength of the population from which it is drawn. Before descending into the realm of details, it is necessary to be clear as to the aims to which we are to look, and those who have considered the subject will, it is believed, be prepared to admit that, accepting the efficiency of the volunteers at the present standard, taking the average efficiency throughout India, it is better, if it be necessary to decide between two things, to increase the numbers rather than to sacrifice the numbers to an increase of efficiency. And, first, we must consider what duties we require the volunteers to perform in case of necessity.

Duties required from volunteers.

We do not require them to attain the standard which is laid down for regular troops either in discipline, drill, or interior economy. We do not require them to leave the places they inhabit, and to take the field against an enemy at a long distance from their homes. It is true there may be occasions in which bodies of volunteers, whether mounted or infantry, may, in time of pressure, be sent to occupy a point to oppose an enemy, or to rescue an isolated post, at a distance from the station or district in which they may reside, and we may be certain that in any disturbance of the public peace, whenever such a danger may come, a measure of the kind would be promptly supported by the volunteers themselves. In the larger centres, again, where in time of urgency the considerable bodies of volunteers now existing would be augmented, it might be practicable to form provisional companies, or even battalions, the members of which would be willing to give their services at a distance from their own stations if the public need demanded it, and they could leave those stations with the belief that their own families and belongings were secure from danger. But exceptions which might be produced under the pressure of events cannot invalidate the general rule that volunteers are essentially for local defence. Those valuable bodies, the railway corps, are of course on a somewhat different footing to the other corps in India, in that

the duty of a large proportion of the members necessarily involves their travelling over at least a section of the line of railway to which they belong, and in time of need detachments would be quickly conveyed to any particular point where the line of communication was threatened. But speaking generally the duties of the volunteers are distinctly local in their character, and this is expressly provided in Section 16 of Act XX of 1869. And, although it is desirable that this clause should be remodelled to suit the changed circumstances of the times and of Indian cantonments or civil stations, and a more extended limit than that of four miles fixed, it expresses very clearly a fundamental principle of volunteer service.

In stations where British troops are maintained the volunteers would be of the highest value in setting free for work in the field all those able to march, and in taking their places in the garrison. To them, aided by a small detachment of regular troops, would be entrusted the care of any fort or fortified post in which in time of danger the women and the children, the sick and the treasure, would be secured and housed. They would be called upon to furnish guards over the magazines and other important points, to protect railway bridges and stations, to furnish picquets and patrols, and to secure the safety, by every military means, of the cantonment or the station at which they resided. The volunteer force is therefore essentially a garrison army. And while there is no question that the higher the efficiency in discipline, drill, and general military training, the greater the value of the military body, we must recollect several considerations which, if justly appreciated, will make us accept, in ordinary times, a standard lower than that which professional soldiers would usually regard as necessary.

The volunteers are essentially a local force for garrison service.

The service of the volunteers is unpaid, and if the expenses of the individual members are but small, it must be remembered that even to attain a moderate standard of efficiency, they must make a considerable sacrifice of their leisure and of their personal comfort and convenience.

Service unpaid and personal sacrifices necessary.

In England the active work of a volunteer is precisely what is suited to a large portion of the population, whose work lies indoors, whose lives are passed in sedentary occupations. A large proportion of them have not the means for indulgence in field sports, however strong may be their inclination, and hence in the route march, enlivened by the inspiriting strains of a good band and the interest and admiration of the fairer

Volunteering in England a pleasant exercise, but harder work in India owing to climate.

part of the population, or in the military exercises on parade, they find a pleasant counter-influence to their ordinary habit of life. But in India, in most parts of the country, and for the greater portion of the year, the climate operates against acquiring efficiency in military exercises, while the majority of volunteers are busy men, to whom it is no small sacrifice to give up even a few of their leisure hours, which may, with a large number of them, be devoted to some more agreeable and interesting form of occupation than that which can be afforded at the hands of the drill sergeant.

In time of pressure the standard of efficiency would be quickly raised.

Undoubtedly, many things can be improved both by the volunteers themselves and by outside influence, and such measures as would appear to be desirable to this end will be brought forward hereafter. But, whether these succeed or not, and even supposing that only the present standard of efficiency is retained, it must be remembered that under the pressure of national danger, under the pressure of those motives which would impel the volunteers to make any sacrifices conducing to the safety and welfare of those belonging to them, and to the general security, a great stimulus would be given, by which, if properly directed, every volunteer corps in India, composed as they are of intelligent men, might be raised in a short time to a far higher standard of military efficiency than at present exists. The normal standard of efficiency is fairly stated in Article 221 of the Volunteer Regulations, which runs as follows:—"A fair knowledge of simple movements, with a thorough practical efficiency in the use of the rifle, should therefore be the first desideratum in the training of every volunteer. That once accomplished, and with competent instructors it is of easy accomplishment, a more extended knowledge, if opportunity is given, can be rapidly acquired.

The first object is to increase the numbers of the volunteers.

Granting, then, that higher efficiency is desirable, it must be allowed, if the foregoing conclusions are sound, that the first object is to increase the strength of the volunteer force in India. We must now consider what are the measures which should be adopted to this end, and what advantages can be fairly granted to the present volunteer force, so as to induce more to come forward from the ranks of the European population of India. There are two classes of measures which would tend to increase the strength of the volunteers,—the one by increasing the advantages, whether individually or collectively, which should be possessed by the volunteers; and the other by the adoption of some means of pressure to induce men to enter the ranks of the volunteers.

In discussing the first class of measures, it may at once be said that all do not enrol themselves from patriotic motives. Some enlist from that martial feeling which all, with English blood, have in a greater or less degree; others from the conviction that a particular uniform is becoming to their appearance; others, again, because they like the attraction of the rifle shooting; while others are impelled to volunteer, because their friends urge them to join the movement, or because they foresee social advantages to themselves.

Causes leading to enlistment as volunteers.

Much can be done by the recruiting powers of the existing volunteers; but in order to enlist their influence they must be satisfied that the force meets with due encouragement. For the moment we may put aside those particular measures which may be advocated when we examine more closely the lines upon which the future organisation should be worked. What we have to do at present is to enquire whether there are certain additional advantages which should be conferred on those who devote themselves gratuitously to the service of the State. And first it may be asked whether the annual capitation grant of Rs. 20 for every efficient volunteer, together with the grant of Rs. 10 for extra efficient, and the special annual capitation allowance of Rs. 25 for every qualified officer or sergeant, is sufficient. It is believed that a careful consideration of the question will show that it is not necessary to increase that allowance. Relief to the funds of a corps may be provided in other ways, but these will be less objectionable than an increase to the annual capitation grant. It is of course necessary to declare at the outset that any plan for paying volunteers for the number of drills they may attend beyond those required to make an efficient volunteer is out of the question, for to admit such a principle would be to strike at the root of real volunteering. As a matter of fact, in nearly every corps throughout India, the actual expense of volunteering to the members of the corps, except the officers, is but trifling, consisting in some small subscription to a band where such exists, or to other regimental funds. Of course there are corps whose numbers are small, and whose expenses are greater than those larger corps which exist in populous stations or districts; and where there are exceptional circumstances, it would be better that they should be exceptionally treated, rather than an impoverished state of the funds should at last end in the final collapse of the corps.

The question whether additional payment should be made to volunteers answered in the negative.

Privileges and responsibilities of Europeans to be conferred on the Indo-European community together with State education for their children.

One of the greatest inducements that could be offered to a large class from which volunteers might be drawn, and which is practically a portion of the European community in India, would be to grant the privileges of British-born subjects to all belonging to that community, at the same time opening up the avenues of employment in every branch and department of the State. And if it be the case that the Armenians in India, by their treaty of 1688 with the Hon'ble East India Company, "can be appointed to civil honors and appointments," and that in fact "they are in all cases and on all occasions to be treated as if they were actually born in England," it does not appear that there is any reason why those who are knit to us by the ties of blood should not be regarded as an integral part of the European community and invested with its privileges and responsibilities. Then, again, the application of a system of (State) education to the children of Europeans of every class, using the term in its widest sense, would do much to unite this population, to train its members for useful careers, while if military exercises formed a portion of the physical education, not only would the physique of the races be improved, but it would follow that an inclination would be created to enter the volunteer service, an inclination which would be greatly strengthened if more systematic encouragement were given to the formation of cadet companies. The late Lieutenant Governor of the North-Western Provinces, Sir George Couper, declared that there was no better established fact in connection with the social life of the Eurasians in India than their earnest desire to give their children a good education.

The difficulties of education for Europeans in India, and the necessity for a system of State education.

It has been estimated that there are in Calcutta, alone 5,000 European children of a school-going age, and in the Bengal presidency altogether about 14,000 with a total of some 26,000 in the three presidencies, which is no doubt considerably under the actual number. Archdeacon Baly has pointed out the serious disadvantages at which such children are placed. They are brought out, he says, or are the children of those brought out, to do special work only to be done by Europeans. The climate is uncongenial to them; their mode of living necessarily expensive; they are distributed in small numbers over the whole country; and they are deprived of the great educational advantages which are given to children at home. And he forcibly points out that these children are not therefore living on equal terms with the pure Asiatic natives of

the country, and that great stress should be laid on the fact that the character of the individual European is of infinitely nearer concern to an English Government than the character of the individual native. All must agree in the principle that the European inhabitants of this country should be maintained at a high standard of intelligence and morality, and that no means to attain this end should be neglected. State education, combined with physical training in military exercises, is undoubtedly one of the means to this end. And if it appears that these remarks are only indirectly connected with the question of volunteering, perhaps a little thoughtful consideration of the subject will show to those who care to go deeper into the matter, and which cannot indeed be attempted in this paper, that the knitting together of the whole European community by placing them on one footing of privilege and responsibility, by the introduction of general education and by requiring a military training to be a portion of that education, would ultimately increase the strength of the volunteer force and add to our military power in this country.

Turning to the volunteers themselves, as they now exist, any measures which would improve the condition of the officers would favorably react upon the corps. As far as regards the system under which officers of volunteers are appointed, there do not seem to be any particular advantages which need to be conferred. When corps are established, the wishes of the members ordinarily govern the appointment of the commandants and field officers, although they are not officially elected by the members; and although the appointments are made by the Government of India, there is plenty of room for the wishes of the corps to make themselves felt. Speaking generally, it appears to be desirable not to disturb the system which at present exists. No system can be perfect, but it is probably the case that the present one answers all requirements. Upon the selection and training of the officers very much depends. As a rule, men of good social position should be chosen, but they must be active, intelligent, willing to learn, and determined to make themselves efficient officers. But there is no reason why those of less standing in the social scale should be debarred from rising, if they prove their qualification for the commissioned rank. The officers can, if it be found necessary, be encouraged to qualify themselves for their responsible positions in various ways without adding in any material degree to the military expenditure. They may,

Unnecessary to alter system of appointing officers. Encouragement to be given to officers.



for example, be encouraged to go through a course of training in this country with a British corps, or, when in England, to pass through the various schools of instruction, and a contribution might be made towards their expenses when undergoing such training. They might be allowed the privilege, where feasible, of obtaining arms, uniforms, and accoutrements from the public stores at cost price. Field officers might be permitted to select remounts on the usual terms. Officers who have done good and long service in the cause of the Volunteer movement might be selected for honors and decorations as an acknowledgement of those services, as has been done at home. A wider scope may be given to the rules regarding the grant of rank on retirement, service in the ranks being counted towards the qualification, and in special cases where the officer is particularly deserving of the honor, a step of honorary rank might be given on retirement.

Latitude given to volunteer corps not to be interfered with.

It should be maintained as a general principle that the latitude which is given to corps in various matters should not be interfered with. It is exceedingly desirable, for example, that every corps in India should have a serviceable and, so far as is possible, an attractive uniform. There are many reasons why endeavours should be made to induce the volunteers to accept one uniform for the entire force,—scarlet in the winter and khaki in the summer,—the distinctions of corps being made by means of facings, badges, and numerals. The advantages of a uniform not differing too markedly from that in use in the regular army, and which would permit the volunteers being transferred from one corps to the other on a change of residence without expense, would be great, but the improvement should not be forced upon them. If the matter is fairly discussed, they will probably adopt the proposal of their own accord in course of time.

Additional advantages to be given to volunteers.

While it is not necessary to increase the capitation allowance, except under special circumstances, there are various ways by which additional advantages may be given to the volunteers and additional inducements offered for enlistment. Thus, prizes might be given for shooting and for exercises, and rifle clubs and associations encouraged; the number of rounds of ammunition might be increased for match and target shooting; suitable head-quarters might be built or hired by Government where public buildings are not available; in small detached squads, where sergeant instructors from the regular army might not be necessary as a permanent arrangement, qualified volunteer instructors

might receive payment for their services; a band allowance might be given where that desirable institution could be supported; camps of exercise might be frequently encouraged by an extra grant, and by provision of transport to and from the camp, free rations, and camp equipment, &c.; volunteers might be permitted to travel free by railway when attending drills; a medal for long service and good conduct might be granted to volunteers of proper qualifications; and they might, with certain conditions, be allowed to wear the uniform of their corps on retirement. Such small advantages as the distinction by a badge of those officers and non-commissioned officers who have certificates of proficiency, and perhaps a relaxation of the rule regarding the number of drills which a volunteer, who has been several years efficient, would have to put in to obtain his efficiency badges, might also be serviceable in satisfying certain points in the volunteer system, which appear to require some alteration.

There are, of course, many points which may be taken up under the head of organisation, but at present we are only dealing with the question of granting those additional advantages to volunteers which appear to be demanded by the circumstances of the force, and which, in the aggregate, may have some influence in rendering volunteer service more attractive, and, assisting towards the contentment of officers and men, may thus re-act favorably upon the recruiting. All this will undoubtedly cost money if carried out, but whatever we may spend—and excessive expenditure in this direction is not necessary—we should obtain our money's worth in the increase to the number and to the efficiency of an important part of our military strength, which may in the future receive a greater degree of public interest and confidence than is now bestowed upon it. Such a recognition would follow in the wake of that which has been accorded to the force at home, which, at first looked upon as a plaything, and whose members were treated with a mixture of good humoured forbearance and derision, has at last come to be regarded as an integral part of our defensive organisation.

The expenditure of money on a worthy object, one that is essential to the security of the country, and which at some time may prevent waste both of life and treasure, is not an extravagance. We have not in India, among the European community, a large number of rich men to aid by their subscriptions, as in England, the objects of volunteer corps. Loyal and influential natives may show their belief in the fact that

Improvement will cost money but expenditure re-couped in greater military strength.

Necessary for Government to stand towards Indian volunteers as English public to English volunteers.

the movement is not directed against them, but only against possible disturbers of the public peace, by assisting the local corps with which they may be provincially connected. They may feel that the maintenance of British rule in India is an essential condition of their own existence, and hence they may desire to contribute towards a movement which has for its object the maintenance of public order. But we cannot expect that they should, at present at all events, throw themselves with any special zeal into the movement by assisting its furtherance. The volunteers must, therefore, look to the Government they serve to stand towards them, at least in some degree, as the English public.

Beneficial influence which can be exerted by Governments and by their civil and military officers.

Among the measures which may be practicable to increase the numbers of the volunteers, there can be little doubt but that the influence of the various local Governments, assisted by the Commanders-in-Chief and the General officers commanding divisions and districts, may be usefully exerted towards still further tapping the reservoir of power which exists. All bodies of men are susceptible to the influences which high officers of the State are enabled to bring upon any particular movement either by their encouragement, or by their failure to take an active interest in it. Much has already been done by the local civil officers and in many cases they have been most active in initiating or promoting the formation of volunteer corps. But if it be once thoroughly recognised that the Government of India attach the highest importance to the development of the movement, and that they will not fail to record their approval of any exertions that may be made in this direction, a further stimulus will be given.

The volunteer movement to be maintained on present basis, and Government servants not to be compelled to join.

The great point is to maintain the volunteer movement on its present basis, not to upset the principles on which it is founded, nor to interfere with the interior economy and working of volunteer corps. The adoption of any half-and-half proposals would turn volunteering into a sham. Reference is especially made to the proposal that it should be a rule of government service that all its servants should be volunteers as a condition of their appointment. Such a measure would strike at the root of volunteering. Government does not pay for the services of its employés as soldiers, and there is no reason why one particular portion of the community should be taxed in service for the benefit of the remainder. It is quite another thing to apply a general principle to the

whole community without exception. Much can be done by the heads of departments encouraging those under them to join the volunteers, and by the officers of every department of the State, whether civil or military, taking an active and intelligent interest in the movement. But this is a very different thing from compulsory service as applied to a particular class of men.

Having thus discarded the compulsory service of any particular section of the community, such as those in the employ of Government, it remains to consider, as briefly as possible, the *second* class of measures which may be adopted to increase the strength of the volunteer force in India. The subject of this paper is not, what is the best defensive organization which can be adopted in India, but the present and future condition of the volunteer forces, and it would therefore be foreign to its scope to enter at any length upon the important question of forming local regiments or establishing a local militia. At the same time, as it cannot be doubted that the establishment of an Anglo-Indian militia for local defence, by which, under an Act of the legislature, the principle would be enforced, that all men are liable to be called to take up arms in defence of their adopted country and for the maintenance of order, would have a very sensible effect in swelling the ranks of the volunteers, it is necessary to touch on this part of the question.

Some eleven years ago a paper was written by Captain Collen on the establishment of an European and Eurasian militia in India, and appeared in the Proceedings of this Institution. The writer started from the basis that a State has the right to demand the services of the citizens for defensive purposes. And after dwelling at length upon the necessity for a local defensive force, and using those arguments with which we are now familiar, and which apply equally to the volunteer force, he came to the conclusion that the institution of a local militia force, organized for local duties in time of trouble, was both feasible and necessary. It was not proposed that the Anglo-Indian militia should be similar to that existing in England, but it was suggested that every male of the European community capable of bearing arms, who was not a volunteer, should receive a light and limited amount of military training during the year; that he should be drilled at the place in which he is residing; that payment should be made for this

Second class of measures to increase the volunteer force. Effect of establishment of Anglo-Indian militia.

Proposal made by Captain Collen in 1872 for the establishment of an European and Eurasian militia.

military service ; and that all should be organised in companies and battalions, and provided with arms, clothing, and equipment, so that in time of need a large reserve would be at hand which could be brought up to a higher degree of efficiency. He pointed out that it would be necessary to divide the population capable of bearing arms into classes according to ages so that, while a certain number of the population would be actually drilled, the older men who had passed a certain age would be exempt from this, although liable to militia service in case of need. The idea was acknowledged as feasible by the larger portion of the Indian Press, and was even touched upon in England.

Proposal made by Major Grey in 1879 for the establishment of local regiments and a militia.

Subsequently, in 1879, a more extensive proposal was made by Major Grey in a paper which also appeared in the proceedings of this Institution. In the first place, Major Grey proposed the enrolment of Eurasian regiments and garrison batteries in the chief towns, composed of men following their own trades, enrolled, exercised, paid, armed, and equipped, but not rationed or lodged, and living with their families at their own homes. The next class was to be enrolled by law in an active militia force, every male of the European community being liable to perform militia service from the age of 18 to 36 years in the active force, and from 36 to 48 in the reserve force ; the only exceptions being efficient volunteers, men who had done three years' military service, and persons physically unfit. Major Grey's proposals, therefore, contemplated three kinds of local military force,—the volunteers, the embodied local or garrison corps, and the militia. He proposed the embodiment of the active militia for 10 days in each year, and that this embodiment should take place in military cantonments, thus laying a very considerable tax in time upon the Anglo-Indian community, and which it is not clear is necessary.

Conditions to be followed in devising an organisation for a militia in India.

Provided the principle of light militia service be once accepted and enforced by law, there would be no difficulty in providing a suitable organisation, fulfilling certain conditions which may be stated as follow:—

1st.—That only those between certain ages, and with certain exceptions, should, in the initiation of the scheme, be called upon to undergo drill and exercise. After the scheme is established, those who had

done, say, five years' service, would be passed into the reserve militia, who would not usually be called out for drill, but only muster annually, and be liable to be summoned to the ranks of their respective companies or battalions for national emergency.

*2nd.*—That no man should be taken away any distance from his home for drill or other purposes.

*3rd.*—That the payment should be sufficient without throwing an undue burden on the finances.

*4th.*—That duties of the force would be for the protection of stations and important centres, and the maintenance of the lines of communication.

There is no question but that the establishment of an Anglo-Indian militia in some such shape, and based on the principles outlined above, would, as time went on, develop into a valuable body for local defence. And it cannot also be doubted that a very large accession of strength would be made to the ranks of the volunteers. But even if this militia service were made as light as possible, it is unfortunately a question whether the European community in India would be willing to accept it. It is useless to recapitulate the familiar arguments which demonstrate how desirable it is that the principle which its establishment involves should be practically recognised and acted upon in India. The obligation of Englishmen to contribute in person to the defence of the realm was legalised nearly six hundred years ago. Every freeman between the ages of 15 and 60 years was obliged to be provided with armour to preserve the peace; but he was protected from leaving his county or shire, "save upon the coming of strange enemies into the realm." The militia of England has always been regarded as a constitutional force, and as a national security. In 1757-1763 militia was raised on the principle of the ballot. In 1829 an Act, which is now an annual Act, was passed to suspend the ballot, but the clauses remained on the statute book. It appears, then, that whatever may be our views in regard to conscription—and for a foreign service army such a measure would be impossible to Englishmen—there is nothing unconstitutional in requiring those who claim the privileges of Englishmen to accept the responsibilities. At the same time, unless under circumstances of great national emergency, a Militia Bill for India would never be forced against their will upon the European community of this country. No doubt when that emer-

Questionable whether the European community would accept such a measure, although there would be nothing unconstitutional in it.

gency arose they would be the first to welcome a measure of the kind; and if the advantages in the greater security of the community were pressed upon them, if they felt that the privileges of Englishmen must be accompanied by their responsibilities, and a practical scheme requiring very light militia service without embodiment were put forward, then it is possible the European community of India would support such a measure, especially if Her Majesty were pleased to afford support to the efforts of Her European subjects in this country by bestowing upon the force some title showing Her gracious appreciation of it.

Measures to be adopted if it be considered injudicious to carry out this plan in ordinary times.

If, on the other hand, the sense of the majority of the community be against it, we can only turn to the proposal already made, for the compulsory education of European children, and that military exercises should form a part of the physical education, together with some such measures as having a Bill ready to be introduced in case of emergency; a complete and detailed census of the European community, according to ages, occupation, and residence; the preparation of yearly rolls forming them into companies or battalions; and such measures as settling how the appointment of officers is to be made, and the sources from which arms, ammunition, equipment and clothing could be supplied in time of need. An experiment of forming voluntary militia corps might even be tried under selected officers in various parts of India, and all preparatory measures might be taken at an inconsiderable expense. Thus, even if the measure could not be judiciously introduced in ordinary times, the minds of all might become accustomed to the proposals, until at last their adoption should be welcomed, or that at least in the hour of danger they might at once be brought into force without the discussion and delay which, in the absence of a prepared plan, must inevitably accompany an attempt of the kind.

Summary of main points discussed so far.

We have discussed so far the advantages of volunteering, the numbers and condition of the population from which the volunteers are drawn, and the measures which are necessary to increase the strength of the force; and an attempt has been made to show that although a considerable increase to the strength of the volunteers by means of the additional advantages proposed might accrue, a great impulse could alone be given by the adoption of the principle that every man owes it to the State to contribute in person to its defence, and that the ranks of the volunteers would be

swelled by the establishment of an Anglo-Indian militia. It is now necessary to discuss what improvements can be effected in the organisation of the existing volunteer force in India.

Of the organisation of the various corps it is not possible to give any fuller account than is to be gathered from the pages of the Army List and from the Volunteer Regulations. And in the Appendix is given a tabular statement showing the various corps and their strengths, with other particulars. One corps may consist of one company of from 40 to 50 volunteers, with its established complement of one Captain and two Lieutenants, its Sergeant Instructor and Color Sergeant, with four Sergeants and four Corporals, while another corps may consist of as many as 16 companies with its establishment of officers and non-commissioned officers according to the quota laid down in the Volunteer Regulations. Some again (see Appendix) are formed into administrative battalions, each consisting of various corps or companies, and even of such diverse elements as artillery, railway, and ordinary rifle, corps, an example of which organisation is given in the administrative battalion of the British Burmah Volunteers.

Then, again, the volunteers in India find in their ranks artillery, Mounted Rifles and Mounted Infantry, and infantry, the latter comprising, not only the ordinary volunteer corps, but the railway volunteers, who may be regarded as rifle volunteers for special service. The first question that presents itself is as to which arm of the service is most usefully represented in the volunteer force. The answer to that question must of course be that as a body volunteer infantry are the most useful. But it may be at the same time observed that Mounted Rifles or Mounted Infantry may be of the highest value, although their numbers can never, it is feared, reach any considerable figure. If every volunteer corps in India had, like the Victoria Rifles in England, a section of mounted men, the value to a defensive organisation would be very great. The efficiency and success of that valuable corps, the Behar Mounted Rifles, and the company of Mounted Infantry recently raised and attached to the Calcutta Volunteers, and the formation of a corps of Mounted Rifles in Cachar, inspire a hope that this branch of the volunteers may be gradually increased. A few Mounted Rifles in every district in India would be of immense value in securing the peace of the country.

Present organisation of the Volunteer Force in India.

Volunteer infantry the most useful arm, but Mounted Rifles very valuable.



Desirable to increase volunteer artillery and to create volunteer engineers.

The artillery is only represented by the Duke's Own Volunteer Artillery at Fort St. George and the Volunteer Artillery at Rangoon. The development of volunteer garrison artillery in India is much to be desired. The garrison batteries of Royal Artillery are not too numerous for the service that may be required of them. Siege trains and ammunition columns would have to be manned by them; a considerable portion must always be kept on the coast defences; and the residue would be barely sufficient for the garrison of important places and for instructing and supervising the infantry garrisons in gun drill. It is therefore most desirable that there should be, even if not a battery or half a battery, at least a division of garrison artillery wherever there are forts or entrenchments—and it may be hoped these will increase in number—in which the non-combatant population could be protected. On the coast, too, artillery volunteers would be most valuable, and at appropriate stations all volunteers should go through a short course of gun-drill. The Engineers are at present not represented in the volunteer force; an effort should be made to secure a few companies or even sections of Engineers wherever the numbers admit, as it must be remembered that for military engineering work in this country we are mainly dependent on the native sappers and miners. A proposal has been made to establish naval artillery volunteers. These might be employed,—and a corps was in existence in Bombay not very long ago,—to assist in garrisoning the turret-ships in the Bombay harbour and in manning the forts at the various ports.

Railway volunteers and their value

The railway volunteers are especially valuable. In time of trouble they would assist to preserve the long lines of communication intact. They can pursue their railway duties armed and in uniform, and the detachments or companies at the various stations would, when the final crisis came, assist in repelling attack. The East Indian Railway Volunteers, for example, over 1,000 strong, has 16 companies and about 26 detachments. The 1,500 miles of railway is divided into 12 districts, each with its own sergeant instructor, and a complete organisation exists for defensive purposes. Not long ago, when there was disturbance in the Sonthal Pergunnahs, an officer went with a detachment with a special engine to the scene of action, while at several of the nearest stations detachments were held in readiness, rifles and ammunition issued, provisions for three days secured, and everything placed ready in vans. The loyal and spontaneous offer of the East

Indian Railway Volunteer Corps to proceed to Egypt last year, as a railway corps, bear witness to the fact that they are valuable, not only as infantry, but for special railway duties.

The next question to be considered is whether the present arrangements should continue, of the volunteer corps remaining under the local Governments and the Government of India. There is no doubt that there would be some advantages in placing the volunteers more directly under the military authorities, and perhaps, hereafter, when the movement has taken greater root and developed a larger force, it may be possible that this should be done; but the consideration of this question may be appropriately deferred until the time arrives when all military bodies in India are placed under the Commander-in-Chief. It is perhaps on the whole better that they should, at present, while enlisting the sympathies of the military authorities, remain under the protection and encouragement of the local Governments, whose administration is vitally concerned in the development of the volunteer force in India, as one means of securing the peace of the provinces over which they rule. But although the local Governments and the Government of India are deeply interested in the volunteers, it is an acknowledged defect in the present system that there is no one competent military authority to whom all volunteers can look to promote their efficiency and to watch over their general interests. Scattered over a great continent, with very few opportunities for meeting, and with no power of comparison of efficiency, it is not to be wondered at that improvement is very often unequal in the various corps, and that the military efficiency of the whole force suffers accordingly. It is needful, therefore, to have one officer who shall be the head of the volunteers as Inspector-General of the Force in all its branches. The duties of an Inspector-General would be very varied, and would range from exerting himself with the great civil local authorities for the encouragement of volunteering, down to every detail of organisation and equipment and the uniform instruction of the various arms.

Volunteers should remain under local Governments and the Government of India, but the appointment of an Inspector-General is desirable.

The next point is the necessity that, as far as practicable, every volunteer corps in India shall find its place in some administrative battalion. At the present time there are only the administrative battalions of the Presidency Volunteers, the Punjab, the North-Western Provinces, and Burmah. The administrative battalions should be so formed that they do not enclose too great an area, and the head-quarters should be centrally

Organisation of all corps in administrative battalions necessary.

situated. The commandant might either be chosen from the volunteer officers, in which case the headquarters would have to be wherever he was stationed, or from such qualified officers of the regular army as may be thrown out of employment by the limit of tenure of the regimental commands. In the case of the appointment of these officers it is desirable that they should receive some staff allowance in order to meet the extra expenses which attend the appointment of a commandant of volunteers. No corps in India should be without that trained help which an adjutant of the regular army gives; and if there be some corps which cannot be included in administrative battalions, then it would be better to make an exception in their favour and bring them within the scope of the nearest adjutant of volunteers. Considerable latitude is given by the regulations in regard to the strength of battalions and companies and the lower units, and it is right that it should be so. It would be impossible to lay down any hard-and-fast establishment for volunteers, as the circumstances vary in each station. In some places only small squads of a few men can be raised, and in others sections, half companies, or companies. The lesser units must of course be organised into a company, although the area may be large, but the great principle is to preserve sufficient elasticity in the regulations, so as never to lose a single volunteer.

Drill and training  
of volunteers.

The drill, training and musketry instruction of the volunteers are treated of in the Regulations of the Volunteer Forces in India, which it may be hoped will soon be recodified. It is not therefore necessary to do more than to call attention to the necessity for practical simplicity in the drill and instruction for volunteers. It is occasionally suggested that the benefit would be very great if more frequent opportunities were given for the volunteers to be brigaded with the regular troops. If volunteers attain proficiency in the simpler movements and the various military exercises, there is no reason why they should not be brigaded with regular troops, if their officers are competent to command them in brigade, and the volunteers themselves able to perform what is required. Much interesting practical work may be done by the volunteers and their officers in that which would tend to make them familiar with the various military situations in which they may be placed. The formation of advanced and rear guards, outpost exercise, the formation and duties of guards, the posting and duties of sentries, the

defence of fortified posts and buildings, of railway stations and bridges, the practical working out of schemes of defence are all matters which can be quickly mastered by intelligent volunteers under the guidance of their adjutant and officers, and illustrated by practical lectures by him and other officers of the army interested in the movement. The practice of army signalling, construction of small entrenchments, and such exercises as placing buildings in a state of defence, are matters which can be well undertaken by the volunteers, while the formation of ambulance classes under medical officers would give opportunities for attaining another branch of knowledge which might prove of value. With artillery it would be well that the volunteers should be trained in the use of the carbine, because, whatever may be the case with garrison batteries of Royal Artillery, it is desirable that all volunteers should be taught to use small-arms. Above all, volunteer camps of exercise should be assisted to the utmost, for they may be made the occasion, not only of the attainment of practical knowledge which could not otherwise be gained, but of pleasant social gatherings which it is desirable to encourage.

The position of the officers has already been touched upon, and it need only be observed that they should be encouraged by every means to fit themselves for their responsible positions. The commandants should be selected for their physical and mental qualifications, for their own interest in the volunteer movement, and for their social position; and the local Governments, as well as the Inspector-General, should be careful to watch the way in which the commandants perform their duties, for on these officers depends, in a great degree, the vitality of the volunteer movement. These remarks apply *mutatis mutandis* to the appointment of adjutants of volunteers, each of whom should be the staff officer of the commandant of the administrative battalion, but ready to help the commanders of corps and all officers and volunteers in perfecting themselves in military training. To each administrative battalion there might be a Sergeant-Major Instructor from the regular army, and this arrangement might perhaps operate as an encouragement to the Sergeant Instructors of the regular army. A liberal interpretation should be put on the regulation, that, where distance is a difficulty, Sergeant Instructors should not be required to live in barracks, but that their time should be wholly given up to the volunteers. As it is desirable to encourage intelligent, active, and

Remarks on the appointment of commandants, officers, adjutants, and sergeant-instructors of volunteers.

energetic non-commissioned officers who are good drills and shots to come forward as Sergeant Instructors, it may be necessary hereafter, if the supply of such men should fall short, to increase their advantages. Volunteer officers and non-commissioned officers should be encouraged to qualify themselves for the appointments of Adjutants, Quartermasters, and for the other subordinate appointments necessary in a battalion.

Uniform, arms, and equipment. Armoury to be safe. Supply of ammunition in the field. Kit.

In regard to the uniform, arms, and equipment of volunteers, there is not much to be said. Indian volunteers are already equipped with the best arm in the service, and as the question of uniform has already been touched on, it is only necessary to say that it does not seem desirable that the volunteers should have their uniform supplied free or otherwise from the Army Clothing Department, if they can make good local arrangements. Certain things, such as arms and equipments, must be supplied from the public stores, but it is desirable, as far as possible, that each corps should be rendered in every respect self-dependent. Unless a safe and readily accessible armoury is provided, the arms, ammunition, and accoutrements, should be in the possession of members. The equipment should provide for the full amount of ammunition which the infantry soldier carries on his person, and volunteers should frequently be exercised in the supply of ammunition in the field. It is not necessary at the present stage of the movement that volunteers should be provided with kits, or with camp equipment, but it would be advisable that a scale of kit both for officers and men should be laid down, and that corps should be encouraged to adhere among themselves to certain uniform patterns.

#### Summary.

In the foregoing pages, an attempt has been made to shew how essential a development of the volunteer force is to the maintenance of the peace and security of India. Some investigation has been afforded of the numbers and classes from which the volunteers are drawn, and an effort has been made to shew that any measures favorably affecting the education and social condition of these classes will re-act for good upon the volunteer force in India. The conclusion has been drawn that it is better to increase the numbers rather than the efficiency of the force, but that such advantages and improvements as can be given to the volunteers will effect both objects. While deprecating any attempt to compel a particular class to give their services to the volunteers, a sketch has been given of proposals for forming a general defensive force from

the Anglo-Indian community, and a deduction has been made that the adoption of such a measure would tend to increase considerably the volunteer forces of India. Various improvements have been suggested in the organisation of the existing force, and it has been argued that it is worth while spending more money on the volunteers. Certain portions of the subject have been under official consideration, but it is not known what conclusions have been arrived at, and such information and opinions as have been recorded in these pages have not been derived from any official source, but are the outcome of recent public discussion, and of many years' consideration of the subject of volunteering generally, commencing a quarter of a century ago, when the writer served in the volunteer force of England and was instrumental in helping to raise one of the earliest volunteer corps.

If the volunteer force of India be generously encouraged, it will, there is every reason to hope, rapidly increase in numbers, and with those who have passed through the ranks, will form a lasting strength to the British Empire in India. Within the last twenty years wonderful progress has been made under the British administration. Many thousands of miles of railway and of telegraph have been constructed, millions of acres of land have been irrigated, and we are told that in a little more than this period, 150 millions of money have been spent on the great public works of India. Day by day the Government of India is working for the benefit of the subject races. Nothing is neglected, no pains are spared to attain the desired end; a scrupulous regard is paid, not only to the rights and privileges of the great chieftains of the land, but to those of the lowest and meanest class. Toleration in religion is universally practised towards all; person and property are more secure in this country than in almost any other in the world; cruel customs have been suppressed; and lands which for centuries have been the battle fields of invading armies and the human hunting-ground of oppressors, are now flourishing in the happiness of peace and quiet. Races which for centuries have been oppressed and ground down under the iron heel of merciless rulers are now free to till their fields peacefully, or to follow their own ways in the pursuits of commerce, of arts, and of letters. Without undue vanity it may surely be said that if the British rule came to an end today history would record that there had never been so

Benefits conferred upon the peoples of India by British rule.

splendid an achievement as the conquest of India, and that never had conquerors bestowed upon the conquered such even-handed justice, and such moral and material benefits.

The continuance of these benefits dependent on the maintenance of order.

The continuance of these great advantages to the various peoples of India can alone be secured by the maintenance of order. That order is preserved by the civil power and its police, supported by an efficient, loyal, and well-disciplined native army. But it can alone be absolutely insured by the British Army in India aided by the organised strength of the European community.

*April 1883.*

# **APPENDIX.** *Strength and organisation of the Volunteer Force in India.\**

| Province.  | Title of Corps.                    | Head-Quarters Station. | When raised.                  | Enrolled strength. | No. of efficient. | No. of companies. | Color of uniform.          | Remarks.                                                                                                                                                                                                                            |
|------------|------------------------------------|------------------------|-------------------------------|--------------------|-------------------|-------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bengal ... | Adm. Battn., Presy. Volunteers.    | Calcutta ...           | 3rd Feb. 1863<br>[Cadets ...] | 612<br>343         | 519<br>309]       | 14                | Green, with green facings. | Of the 14 companies, 1 is a mounted company and 5 are cadet companies.<br>This excludes the E. B. R. Volr. Corps, which however forms part of the Battn. This corps is attached to the E. I. R. Volrs. for administrative purposes. |
|            | Sibpore College Volr. Rifle Corps. | Sibpore (Howrah) ...   | 19th Aug. 1881                | 45                 | 35                | 1                 | Green, with black facings. | Companies at Saidpore, Kurseong and Jalpaiguri. One of the 5 companies is a cadet company.                                                                                                                                          |
|            | Northern Bengal Volr. Rifle Corps. | Darjeeling ...         | 5th Aug. 1881<br>[Cadets ...] | 295<br>41          | 213<br>41]        | 5                 | Rifle green ...            | Companies at Chumparun, Durbhunga, Sarun, and South Ganges.                                                                                                                                                                         |
|            | Behar Mounted Rifle Corps.         | Mozufferpore           | 8th Dec. 1862                 | 240                | 192               | 5 (troops)        | Blue, with white facings   |                                                                                                                                                                                                                                     |
| Assam ...  | Sylhet Volr. Rifle Corps           | Lungla ...             | 22nd Oct. 1880                | 113                | 17                | 1                 | Khaki with red facings     | .....                                                                                                                                                                                                                               |
|            | Shillong Volr. Rifle Corps         | Shillong ...           | 11th Aug. 1882                | 40                 | ...               | 4                 | .....                      | .....                                                                                                                                                                                                                               |
|            | Cachar Mounted Rifles              | Silchar ...            | 6th Apr. 1883                 | 80                 | ...               | 2                 | .....                      | .....                                                                                                                                                                                                                               |
|            | Luckhimpore Voluntr. Rifle Corps.  | Dibrugarh ...          | 3rd Nov. 1882                 | 60                 | ...               | 34                | .....                      | .....                                                                                                                                                                                                                               |

\* NOTE. —The materials for this table will be found in the Army Lists of Bengal, Madras, and Bombay, and in a tabular statement which has appeared in the public press.



| Pro-<br>vince.          | Title of Corps. | Head-Quarters<br>Station.                                        | When raised.                 | Enrolled<br>strength. | No. of<br>efficient.<br>companies. | No. of<br>efficient.<br>companies. | Color of uniform.                | REMARKS.                                                                                                                           |
|-------------------------|-----------------|------------------------------------------------------------------|------------------------------|-----------------------|------------------------------------|------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| N.-W.P.<br>and<br>Oudh. | 1st Adm. Battn. | Lucknow Corps<br><i>Lucknow.</i>                                 | 10th Jan. 1872               | 291                   | 210                                | 5                                  | Rifle green                      | Detachment at Fyzabad. One of the 5 companies is a cadet company.                                                                  |
|                         |                 | Cawnpore Corps<br><i>Cawnpore.</i>                               | 16th Aug. 1877               | 61                    | 48                                 | 2                                  | Green                            | One is a cadet company.                                                                                                            |
|                         |                 | Naini Tal Corps<br><i>Naini Tal.</i>                             | [Cadets...<br>26th July 1871 | 30<br>185             | 8]<br>185                          | 2                                  | Rifle pattern                    |                                                                                                                                    |
|                         |                 | Rohilkund<br><i>Bareilly.</i>                                    | 30th Sep. 1881               | 134                   | 96                                 | 3                                  | Green                            |                                                                                                                                    |
|                         |                 | Agra Corps ...<br><i>Agra.</i>                                   | 9th Aug. 1878.               | 271                   | 263                                | 4                                  | Rifle green, with red piping.    |                                                                                                                                    |
|                         |                 | Thomason Col-<br>lege Corps,<br><i>Roorkee.</i>                  | 19th Aug. 1872.              | 27                    | 27                                 | 1                                  | Grey                             | One company at Meerut.                                                                                                             |
|                         |                 | Mussoorie<br>Corps ...<br><i>Mussoorie.</i>                      | 24th July 1881.              | 201                   | 201                                | 3                                  | Black, with green facings        | Company at Dehra Dun.                                                                                                              |
|                         |                 | Farukhabad<br>Corps ...<br><i>Fatehgarh,</i><br><i>Allahabad</i> | 24th Nov. 1882.              | 34                    | ...                                | $\frac{1}{2}$                      |                                  |                                                                                                                                    |
|                         |                 | Corps ...<br><i>Allahabad,</i><br><i>Ghazipore,</i>              | 11th Jan. 1871.              | 212                   | 162                                | 2                                  | Rifle green, with black facings. | Companies at Azimgarh, Jaunpore, Gorakhpore, Basti, Benares, Mirzapore, & Chunar. One of the 7 is a mounted company, at Ghazipore. |
|                         |                 |                                                                  | 11th Nov. 1881.              | 258                   | 186                                | 7                                  | Rifle green                      |                                                                                                                                    |
| N.-W.P.<br>and<br>Oudh. | 3rd Adm. Battn. |                                                                  |                              |                       |                                    |                                    |                                  |                                                                                                                                    |
|                         |                 |                                                                  |                              |                       |                                    |                                    |                                  |                                                                                                                                    |



| Province.                                   | Title of Corps.                                           | Head-Quarters Station. | When raised.                  | Enrolled strength. | No. of efficient. | No. of companies. | Color of uniform.         | REMARKS.                                                                                                                                  |
|---------------------------------------------|-----------------------------------------------------------|------------------------|-------------------------------|--------------------|-------------------|-------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Central Pro-<br>vinces ...<br>Rajputana ... | Nagpore Volr. R. Corps                                    | Nagpore                | 29th Dec. 1860                | 79                 | ...               | 1                 | Brown, with red facings.  | Companies at Jeypore, Bandikui, Mhow, Khundwa, Sabarmutti, and Abu.                                                                       |
|                                             | Rajputana-Malwa Volr. R. Corps                            | Ajmere                 | 8th Sep. 1882                 | 544                | 504               | 7                 | ...                       |                                                                                                                                           |
|                                             | 1st Adm. Batta., or 1st Punjab Vol. Rifle Corps           | Lahore                 | 19th Mar. 1880                | 523                | 484               | 8                 | Drab                      |                                                                                                                                           |
| Punjab ...                                  | 2nd Adm. Batta., or 2nd Punjab or Simla Volr. Rifle Corps | Simla                  | Originally raised in May 1861 | 325                | 321               | 5                 | Grey, with blue facings   | Companies at Jhelum, Rawal Pindi, Murree and Delhi. One of the 8 companies is a cadet company. One of the 5 companies is a cadet company. |
|                                             | 3rd Adm. Battalion                                        | Lahore                 | ...                           | ...                | ...               | 11                | Drab with maroon facings. |                                                                                                                                           |
|                                             | Quetta Volr. Rifle Corps                                  | Quetta                 | 8th Mar. 1883                 | 39                 | ...               | 1                 | Is a railway corps.       |                                                                                                                                           |
| Beluchistan                                 |                                                           |                        | Total                         | 8,833              | 6,407             |                   |                           |                                                                                                                                           |
| <b>Railway Corps.</b>                       |                                                           |                        |                               |                    |                   |                   |                           |                                                                                                                                           |
| Bengal ...                                  | Eastern Bengal Railway Volr. Rifle Corps                  | Calcutta               | 1st Mar. 1873                 | 174                | 166               | 2                 | Green, with green facings | Companies at Sealdah and Goalundo. The corps is attached to the Calcutta Volr. Rifles.                                                    |
|                                             | Tirhoot State Railway Volr. Rifle Corps                   | Somastipore            | 17th Jan. 1879                | 21                 | 20                | 1                 | Green with black facings  |                                                                                                                                           |
|                                             |                                                           |                        |                               |                    |                   |                   |                           | Attached to the E.I. R. Volr. Corps for administrative purposes.                                                                          |

# Railway Corps—(Continued)

## THE VOLUNTEER FORCE IN INDIA.

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| Province.                                         | Title of Corps.                                                        | Head Quarters Station. | When raised.      | Enrolled strength. | No. of efficient. | No. of companies. | Color of uniform.            | REMARKS.                                                                                                                                                                            |
|---------------------------------------------------|------------------------------------------------------------------------|------------------------|-------------------|--------------------|-------------------|-------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bengal and N. W. P. and Oudh.                     | E. I. R. Volr. Rifle Corps.                                            | Jamalpure...           | 17th July 1869... | 1,108              | 1,065             | 16                | Green, with black facings.   | Companies at Tond-<br>la, Allahabad,<br>Howrah, Calcutta,<br>Mokameh, Dinapore<br>Buxar, Girdi, Burd-<br>wan, Ghazecabad,<br>Aligarh, Patna, Sahib-<br>ganje, & Assensole-<br>..... |
| Burmah ...                                        | Rangoon and Irawaddy<br>State Railway Volun-<br>teer Rifle Corps.      | Rangoon ...            | 2nd May 1879...   | 195                | 176               | 2                 | Scarlet, with blue facings.  | Companies at Poona,<br>Lanowli, Solahpore,<br>Jubbulpore, Shola-<br>pore, Blusawal,<br>Hurdia and Igatpuri.<br>Companies at Parell<br>and Ahmednagar.                               |
| Bombay ...                                        | Great Indian Peninsula<br>Railway Volr. Corps.                         | Bombay ...             | 29th Dec. 1875.   | 939                | 753               | ...               | Blue, with red fac-<br>ings. | Companies at Suk-<br>kur, Ghazecabad,<br>Amritsar, Kotree,<br>Mooltan, Umballa,<br>Karachi, Saharun-<br>pore and Sibi.                                                              |
| Bombay ...                                        | Bombay, Baroda & Cen-<br>tral India Railway<br>Volr. Corps.            | Bombay ...             | 3rd Sep. 1877 ... | 193                | 120               | ...               | .....                        |                                                                                                                                                                                     |
| Punjab and Sind.                                  | 3rd, or Sind, Punjab and<br>Indus Valley Railway<br>Volr. Rifle Corps. | Lahore ...             | 5th Mar. 1880...  | 750                | 714               | 11                | Drab, with maroon facings.   |                                                                                                                                                                                     |
| Total ...                                         |                                                                        |                        |                   | 3,380              | 3,014             |                   |                              |                                                                                                                                                                                     |
| Total Volunteers not including Railways Corps ... |                                                                        |                        |                   | 8,833              | 6,407             |                   |                              |                                                                                                                                                                                     |
| Total Railway Corps ...                           |                                                                        |                        |                   | 3,380              | 3,014             |                   |                              |                                                                                                                                                                                     |
| Grand Total of Volunteers in India ...            |                                                                        |                        |                   | 12,213             | 9,421             |                   |                              |                                                                                                                                                                                     |

Present state of feeling among the  
native population of India, has coincided  
by guess & conjecture. The collection of  
MSs of Sanskrit & Hindi, & the  
date that British Government India, albeit  
repugnant to short-sighted prejudices  
Feeling of native Princes. The Substance of  
1887. Annals of native States. Review of  
recent measures taken for protection of  
India from foreign invasion. Further  
of and re-provision of status of British  
Princes. Little native Princes. Further  
native Princes, their position, necessity of  
abolition of ceremonial

Our main power is the first consideration.  
We see efforts at home & abroad to  
in India & elsewhere. We see, but down our  
expenditure, to increase military

What the Crown for population have already  
done in the mounting & other emergency  
European association. Desirability  
of cementing good feeling between Europeans  
& Europeans.

## II.

### THE VOLUNTEER FORCE IN INDIA, ITS PRESENT AND FUTURE.

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*Pro Focis et Aris.*

BY

MAJOR C. A. DODD, BENGAL STAFF CORPS.

#### ITS PRESENT.

The present condition of the Volunteer Force in India may be briefly stated. Roughly, its numerical strength amounts to 12,000 of all ranks, of whom some 9,000 or 9,500 are efficient. The East Indian Railway Corps stands highest, 1,100 members; next the Great Indian Peninsula Railway Corps with 930; then the Bombay Presidency Battalion, 800; and the Sindh, Punjab, and Indus Valley Corps, 750; the remainder being under 700 each. The oldest Volunteer Corps is that at Nagpore, raised in 1860; next the Punjab Battalion, 1861; then the Calcutta Infantry, and the Behar Mounted Rifles, 1862; most of the others having been more or less recently organized. Except in the Railway Department, where Volunteering is almost, if not altogether, reckoned a condition of service, the duty of civil-soldiering has everywhere been voluntarily undertaken.

Each member of a Volunteer Corps in India has to attend, if previously efficient, nine drills per annum, or if a recruit, thirty. He has also to pass through an Annual Course of Musketry, and to be present at the Annual Inspection. These qualifications entitle the Corps to claim on his account a yearly sum of Rs 20, or if he be extra-efficient (*i.e.*, efficient with 80 points in the Annual Course), Rs. 30.

The present Volunteer movement in India no doubt chiefly owes its origin to the Mutiny of 1857; its growth being stimulated by the personal energy of individual officers of position and influence, perhaps also by the success of the movement at home, and occasionally, here and there, by the existence or rumours of local panic. The civil community too recognize more and more every year the advantages to themselves and the Government of a further extension of the movement in their midst. An appreciation of those advantages has been particularly shown of late at isolated stations in the North-West, and it is believed in other parts of India also. It may be noted here that during the Mutiny, although there was no organized system as at present prevailing in the country, the Volunteers—bodies of men raised to meet the exigencies of the occasion—rendered services that were of conspicuous benefit to the State: notably the Volunteer Guards in Calcutta

(under the late Colonel Davis), who greatly contributed towards the restoration of confidence among the inhabitants of that city; the Yeomanry Cavalry, under Colonel Richardson; Havelock's Volunteer Cavalry, under Captain Barrow; the Arrah Garrison; and the gentlemen who fought alone or materially aided the military service in the protection of life and property at Agra, Allahabad, Lucknow, and other parts of the Empire. The existing Volunteer Corps have hitherto not been required to perform any such active service. Their duties, on the other hand, have been confined to the acquirement of military knowledge, and to aid them in this task, Corps have been provided with Adjutants and Drill-Instructors, and have from time to time been permitted to take part in the manœuvres of the regular troops. The above, as nearly as possible, summarizes the present state of the Volunteer Force in India.

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#### ITS FUTURE.

To every one who appreciates the value of Volunteer organization in this country, and has had some experience of that organization in its present state, it is clear that the general tone of the movement is not so healthy as it might and should be. This is almost conclusive from the fact that out of 600,000 persons of European descent in this country, about one in fifty is an enrolled Volunteer. But, apart from this, as a rule men do not regard it an honour, a privilege, a pleasure, to be a member of a Corps, but a bare duty, a drudgery, a trouble. They do not feel that to join the Volunteers is the right and proper thing to do on coming to a station, but rather the rare and unnecessary evil of an Indian career. In a word, Volunteering on its present footing is not attractive; it more often brings a man into ridicule or derision than into good repute. To obviate all this something more is required than the mere disbursement of a capitation allowance, prizes for rifle competition, or an occasional laudatory notice from the Head of the Government and the Inspecting Officer. I propose to discuss the remedy under two heads:—(1) PROPER ORGANIZATION, and (2) JUDICIOUS ENCOURAGEMENT.

##### (1) PROPER ORGANIZATION.

The first question suggested by this heading is one that has been considerably discussed of late years—*Should Volunteering be compulsory?*

It has been proposed rather frequently, and by good authorities too, that the best way to secure a good and permanent Volunteer service in India would be to make enrolment a condition of service, and then to bestow some small pecuniary allowance for each turn of duty rendered. But the first proposal appears to involve as great a paradox as the second. Voluntary service would lose its chief worth, not to mention its very meaning also, if it were either compulsory or paid for. It is the *spirit* in which such service is undertaken that constitutes its real value, and to destroy that spirit by resort to coercion or by the allurements of pecuniary reward, would be to remove one of the proudest boasts of the English nation.

Again, it has been urged that if the Viceroy or Provincial Governors would only bring some little pressure to bear on the members—and particularly on the leading members—of the various Civil Services and Departments, most, if not all, would join the movement at once. But here, again, we have conscription, though in a milder form. Good, active, interested Volunteers are not to be won by a circular from the Secretary to Government. By this means departmental chiefs might possibly join for a time, and by their example clerks and others might deem it expedient to enlist also. But in such instances the flesh would be weak—very weak to act upon a harmless hint—while the spirit would be unwilling. Such Volunteers would possibly do the exact amount of work that rules and regulations demanded of them, but they would do no more; and they would ever be longing for a transfer of the Government into other hands, gradually to loosen the shackles of military service with which the existing *régime* had used its influence and position to bind them.

I do not believe, then, that the interests of the Volunteer movement in India are to be promoted by either of these means, direct or indirect compulsion. It may be fairly argued, at the same time, that India, above all other countries, should have a large Volunteer Force; that critical times have come and may yet come again in the history of this Empire; and that every one who is capable of bearing arms should qualify himself to be of some service, if not to his Queen and country, at least for the protection of his own "hearth and home." Indeed, it may be difficult to understand how men fail to appreciate their position and recognize their duty in this respect. The remedy, however, is to be found elsewhere than in coercion or official interference of any kind. If a man disregards what really should be esteemed a privilege, he will regard it none the more in that light by having its acceptance forced upon him. The State messenger in the form of a legislative enactment, or a Government circular, may go into the highways and byways of officialdom and "compel men to come in;" but men so enrolled would, for the most part, be found "not wearing the wedding garment" in the shape of a loyal, interested spirit or a fitness for the duties they had been driven to undertake.

What, then, should be done? In the first place, I would advocate the constitution of a Volunteer Department. Till the Force is raised to that distinction, and has an officer of experience, energy, and influence at its head, it must ever remain in its present unsatisfactory condition. Some one is wanted to gather the scattered threads into one whole, to introduce and enforce uniformity in discipline and general organization, to secure concessions and other evidences of recognition from the State, and to be the channel of communication—the connecting link—between Commanding Officers and the Government. Were this much conceded to the Volunteers, most other things that they required and deserved would in due course be added unto them. It would raise the whole tone of the movement, and from this change would follow, not only contentment and much additional interest on the part of the existing members of the Force, but also, it is firmly believed, considerable numerical



strength to the ranks. One result would assuredly be secured—Volunteering would suffer less from the sneers and jeers, not only of professional soldiers, but of the community at large. When the Force once became properly organized, properly equipped, and brought under some discipline, it would no longer be subjected to the ridicule it so frequently incurs at present, and a man who joins it would not—as sometimes is now the case—wander over the face of the station in which he is serving with his uniform as a Cain-like mark of reproach. And more than this, constituted as a Department and presided over by influence in high places, the Volunteer movement would enjoy some respect, forced though it might be still, from those who have it in their power to aid and encourage it in many ways. At present, by the higher ranks of officialdom, Volunteering is too often regarded as more or less an impediment to the progress of official work, and so long as such views are held, so long are men discouraged from making the sacrifices they have to make in order to combine the duties of a soldier in the morning with those of a civilian during the rest of the day. A marked change would follow in this direction were the Volunteers recognized as members of a Department of the State.

Having secured, then, the first means of placing the Volunteer movement under a proper system of organization, further discussion in this matter can be subdivided into two heads—*Discipline* and *Drill*.

#### *Discipline.*

The present system of discipline, that embodied in Act XX. of 1869, is in one or two respects open to much improvement. In fact, under the existing law, the chief defect is the lack of discipline owing to the absence of all means of enforcing it. At present men may come and men may go just when and under what circumstances they choose. They can practically attend what parades or obey what orders suit them best; they can be disrespectful or disobedient with impunity, and they can prevent the recurrence of any attempt at reprimand or remonstrance from their superior officers by demanding the acceptance of their resignation within a week's time. It is true that Regimental and also General Courts-Martial can be assembled for the trial of offenders; but these Courts-Martial in connection with Volunteers are extreme and cumbersome measures, and they must necessarily consist of members who have little or no knowledge of military law, and still less of the practices of that form of tribunal. In addition to this, Volunteers are scarcely ever guilty of crimes of violence or open defiance of authority such as would justify the assembly of a Court-Martial. Their offences consist rather of a passive disregard of orders and absence of respectful submission to the wishes of their officers; but none the less do these misdemeanours militate against the maintenance of discipline, the root and foundation of all success in military administration.

There is, to my thinking, but one remedy for all this, and that is a considerable extension of the powers of Commanding Officers. The Commandant of a Volunteer Corps has under the present Act practically no power at all. He can issue orders and he can express wishes, but

he has no means of enforcing them. He can certainly take a defaulter to task for disobedience, but the defaulter can treat the reprimand with indifference, amounting to insubordination, by promptly resigning his membership of the corps. He has no power to punish, and naturally it would be useless to report the offender to the Head of his department with a view to his being properly dealt with by that authority.

To improve this unsatisfactory state of affairs, I would abolish all Regimental Courts-Martial under the Act above quoted, and delegate the power of those Courts to the Commanding Officers of Regiments, subject to appeal to the Local Government should the fine imposed exceed Rs. 16 or Rs. 20. I would further not allow any Volunteer to resign, except with the permission of the Commandant, without at least two months' previous notice of withdrawal; and I would also suggest that, in any case of breach of discipline or other military offence for which a Volunteer may be fined, the penalty should be recoverable on the earliest opportunity by the Head of the civil department or office to which the offender belongs.

### *Drill.*

In the further matter of organization, I am opposed to the existing desire after appearances which the Government and Inspecting Officers directly and indirectly encourage. In India, at any rate, "the rough and the ready" is likely to be of greater service in time of need than "the steady and the smart." The Volunteer can never hope, during his short course of parades, to master the manœuvres of the drill-book with anything like the precision exacted from a soldier of the line, and yet Corps are judged by that standard of efficiency. If they march past, go through the manual and firing exercises, and execute creditably a few battalion and skirmishing evolutions, a favourable report is submitted to Headquarters and the military authorities record their satisfaction with the result of the annual inspection. But to attain this efficiency requires a wearisome course of drill which very soon exhausts the enthusiasm of the keenest Volunteer, and which, to my thinking, is of comparatively small advantage to a Volunteer after it has been accomplished. Most of our Volunteers have enough during the day of red tape and machinery at their office desks, and something novel and interesting is required to attract them to further service out of office hours. Moreover, perfect steadiness on parade, or, if it could be attained, a thorough knowledge of battalion movements, or a complete mastery of the mathematical manœuvres in the Field Exercise Book, would be of small value to him for the work in which he would be most useful to the State as an auxiliary to the regular forces. Good local knowledge, a ready exercise of intelligence, ability to act, and, if need be, fight independently, readiness to labour, think, and make the best of circumstances for himself—these are the qualities which in 1857 made even our untrained Volunteers of great value to the country, and which by a judicious inculcation would be of inestimable benefit to the Government should a similar emergency arise at any future time. To the Eurasians such a training would be peculiarly advantageous, not only on active service,

but as tending to afford them a moral and political education, of which they, it must be allowed, stand sadly in need.

Morally, the climate and other local circumstances indispose youths to manly exercises to which in England they are habituated. On the other hand, military employment, such as I have suggested above, necessitates muscular and intellectual exercises and inculcates self-dependence. Those who have witnessed the facility with which a panic can be generated in a time of profound peace by a foolish, ill-founded rumour of an intended native rising, will bear witness to the advantage of a training to overcome this moral infirmity and eradicate senseless fears, calculated in proportion to their intensity to create the very evil they apprehend.

Again, the peculiar form of Government rendered necessary by the circumstances of the country practically excludes the Eurasian from a share of political power, and consequently he is devoid, to a great extent, of the loyalty which the possession of political power encourages. Moreover, the competition in the labour market, more keenly felt by this than any other class, tends to create an impatience of the authority to which Eurasians, rightly or wrongly, attribute an insensibility to their needs. The discipline of military service, enforced as it should be on Volunteers by the system above described, promotes habits of obedience to constituted authority, also a feeling of usefulness, and inspires sentiments of patriotic duty. These indirect results may not, at present, be perceptible, on account of the absence of anything like real life in the Volunteer movement, but one need not on that account be less confident that they would eventually be secured.

In connection with this subject I may mention that my views are strongly in support of a system under which at least a portion of each Volunteer Corps should be trained as mounted infantry. The arrangement would give us a body of guerilla combatants which in India, above most countries, could perform most effective service—a sort of yeomanry given to independent tactics, and useful, not only for fighting purposes, but for the collection of information and intelligence that it would be impossible for an ordinary soldier to acquire. On this point, and indeed on the proper training generally of an Indian Volunteer, I am of the same opinion as the writer of an excellent note in the *Pioneer* of the 30th December last.

As regards drill, I further strongly advocate some arrangements that shall make attendance at parade less irksome than it is at present. The zeal of the best of men must flag if they are required to attend drill three or four times a week from the beginning of November till the end of March. It would be quite sufficient to call out the Volunteers to a steady course of instruction for two months only in a year, recruits being required to attend three months. All recruits should join on the 1st of November. They would then be prepared to fall in with the rest of the corps on the 1st of December. From the 1st to the 25th of December I would have a steady course of training with compulsory attendance. After Christmas week (which is generally a holiday in the offices) I would have a Camp of Exercise for ten days or

a fortnight, to be held just outside the station, Government supplying tents and also commissariat elephants or carts to bring the men daily to their offices. More real work of a soldier's life is probably learnt in such a Camp than in a whole year of drill on the ordinary parade-ground. From the 15th to the end of January I would have the annual course of musketry, and that concluded, half a dozen more parades, and then the annual inspection. In recommending this limited season I of course do so on the understanding that the work of that brief period is done thoroughly, no excuse, except on medical certificate, being taken for absence from any parades.

It has been urged, I know, that this proposal might interfere with the civil duties of many members of the corps. But the course, after all, merely consists of one hour's attendance before breakfast three or four times a week, at a time of the day when nearly every clerk in every office is up and out of doors, taking horse or walking exercise, or indulging in some other recreation.

While on this subject I may say that I would limit Volunteer service to a period of four or five seasons at the most. If an officer, non-commissioned officer, or private, after the expiry of that period, is pronounced qualified in the ordinary duties of a soldier and is desirous of leaving, I would allow his name to be placed on the Volunteer Reserve List, only requiring of him that from time to time he should see that his name is kept on the rolls of the Corps of the station in which he may reside.

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#### JUDICIOUS ENCOURAGEMENT.

Next to the constitution of a Volunteer Department under an active, interested officer, and a useful popular course of drill, some practical recognition of voluntary service is the most likely means of increasing the good name and securing the success of the Volunteer movement in this country. It may be truly said that hitherto little or nothing has been conceded in this direction. After the novelty of wearing a uniform and possessing a rifle has lost its attraction, a man's career in the Volunteer ranks becomes extremely monotonous. Occasionally this monotony may be relieved by a sham fight, a guard of honour, an inspection, or a rifle meeting; but as a routine life, during the drill season, it consists of three or four morning drills, followed by a hurried breakfast and six or seven hours' labour at the office desk. It must be allowed that in India the undertaking is attended with a great amount of real self-sacrifice and inconvenience, and that something is required to maintain, if not to kindle, some enthusiasm in a service of this nature.

As one of the foremost means of encouragement I would place *Official influence*. The official's superior is the person whom most of the men composing the Volunteer service in this country are anxious to please. Without any reflection on the loyalty of the Indo-Briton, or any doubt as to his patriotic readiness to sacrifice time, and, if necessary, his life also in the service of the Queen, it must be allowed that

in times of peace the Head of his department or office chiefly commands his devotion, and to secure approbation and patronage from that quarter forms the leading principle of his official, and, it may be added, his private life. Now, from many years' experience, I may remark that the action of Government officials would lead one to believe that Volunteering stood in no need of assistance; that it was really of very little moment whether the movement flourished or not; that though it might be creditable to the few who rendered such gratuitous service, yet it was a matter which called for no special interference and no special encouragement. I may go as far as to add that instances have come to my knowledge where to be a good clerk and a good Volunteer has been pronounced almost incongruous. Under these circumstances it has often been a wonder to me, not that we have so few Volunteers in India, but that so much good and loyal spirit prevails to maintain the movement at all.

There is not the smallest doubt that, if officers of position took an active interest in the movement, their subordinates would in a body follow the lead, and the result would be a marked addition to the strength of our Volunteer Corps. It is not politic, as I said before, to enforce the enlistment of all men capable of bearing arms (though under a less liberal Government such interference with the liberty of the subject would no doubt meet with less consideration), but there is something akin to compulsory Volunteering in the Head of an office spontaneously taking his place in the ranks. From one or two offices in India which I could name, the presence of even one of the secretaries on parade, say once or twice a week, has secured the services of a dozen or fifteen strong, able-bodied men who brought credit to the Volunteer movement. This is *the* desideratum—conscription in the mildest form—the Head of the office first joining himself, and then allowing his example to bear on each individual subordinate as to leave him no alternative but to join also, except under the peculiar circumstances of physical incapacity. Little short of this will answer. A mere general expression on the part of the Head of the office or department that the movement has his hearty concurrence, that he is prepared to give an annual prize, and that he hopes the Corps will be supported by the members of his establishment, has no perceptible effect whatever.

I have said that few or no concessions have been made to the Volunteers in recognition of their gratuitous service to the State. By this I wish it to be distinctly understood that reference is not made to the assistance generally which the Government or others have afforded to Volunteer Corps. In many respects, indeed, the Government has been most liberal. The grant of Rs. 20 per efficient and Rs. 30 per extra-efficient man is ample for all the purposes on which the grant should be expended; the supply of tents, carriage, &c., at Camps of Exercise materially facilitates this means of acquiring practical military knowledge; the services of officers from the army as Adjutants of battalions lighten the work of Commanding Officers and contribute to the efficiency of regiments; and the annual medal to the best shot among the Volunteers of each Presidency is indeed a distinction that any

soldier might covet. But none of these acts of liberality actually affect each individual Volunteer. The Commanding Officer appropriates his capitation grant; if difficulties in the shape of carriage, tents, &c., were thrown in the way of his going into camp, the Volunteer could, and probably would, evade the difficulty by not complying with the invitation to attend; and as regards the medal, it can after all only be gained by one out of some thousands of men in the service. What I plead for is some marks of recognition that shall extend more or less to every individual who has joined the movement. These need not be extensive, and need not involve any perceptible expense to the Government; but on that account they would be none the less appreciated, and would none the less stimulate the growth and popularity of Volunteering in India.

Among them I would note some of the following for consideration. The first emanates from Captain E. T. Anthony, of the Madras Volunteer Guards, an officer who for many years has had the movement very much at heart:—

I.—One month's additional service to be allowed to reckon towards pension or gratuity ordinarily admissible under existing rules for every one season or year's Volunteer service, *i.e.*, one additional year for 12 years' Volunteer service, or two additional years for 24 years' Volunteer service, and the concession to have effect retrospectively, so as to benefit those who have already borne the burden of the day, equally with those who may be enrolled hereafter.

The concession might also be made applicable to non-Government servants, as they could be granted a gratuity of one or two months' pay which they may be in receipt of in private employment, according as they at the time of retirement have completed 12 or 24 years' Volunteer service.

II.—Much harm is at present done to the movement (as I have noted before) by the notion that good Volunteer service is somewhat inconsistent with good official qualifications. There is no doubt of the prevalence of the idea, that if a man can find time to attend zealously to the requirements of the Volunteer service, he cannot have much else to do, or if he has, that he cannot perform his other, or office, duties in a satisfactory manner. These are most erroneous and most injurious views. No man has less leisure than an idle man. The really industrious clerk carries his character for industry into other work outside his office, and as an example of this I may note that the department which supplies me with my best and most constant Volunteers is acknowledged to be about the hardest-worked department in the province. This notion, so prejudicial to the interests of the Volunteer movement, might be gradually eradicated by Government signifying its wish (as it has done in some places) that in making appointments to subordinate posts in public offices, preference should, when possible and convenient, be given to candidates who have rendered good Volunteer service. Heads of offices, too, should, to every reasonable extent, facilitate the attendance at parade and the performance of Volunteer duties generally by those serving under them. An hour or half an

hour's leave (according to local circumstances) should be allowed on all ordinary drill days, while in offices which are readily closed on the very least important occasions of native holidays, difficulties should not be thrown in the way of a few hours' leave for Volunteers whose presence may be occasionally required for reviews, sham fights, rifle competition, &c. These may appear small concessions, but from an experience of many years I can state that the willing and cheerful grant of them makes all the difference in the number of Volunteers furnished from a public office. Men simply will not undertake all the monotony and fatigue of drill, and incur all the self-sacrifice and inconvenience which Volunteering involves, if they find that it also means disapproval, indirectly shown as sketched above, on the part of the authority to whom they look for favour and advancement in their official career.

III.—I would now mention one or two concessions that would more particularly affect the poorer classes of the Christian population from which our Volunteer Corps are so largely recruited.

(a.) In England (I am not sure whether it is the case out here) soldiers in uniform are allowed to travel by rail second-class for third-class fare. I would urge the extension of a similar rule to *bond-fide* Volunteers in this country. The wearing of uniform might be waived, as in the dust and dirt of Indian travelling a uniform would soon be spoilt, but in lieu a pass signed by the Commanding Officer might be deemed sufficient to admit of any Volunteer officer travelling first-class, and any Volunteer private second, at the rate charged for tickets of the class below. The Government of India has sanctioned a concession of this kind, but in a very modified form. Volunteers are permitted to travel by rail on the terms I have mentioned, but it must be on a *State* Railway, and the man must at the time be on Volunteer duty. I would extend the privilege to men—men deserving of the concession—travelling on private affairs. As it stands now the favour carries with it only very occasional advantage, for as a rule a Volunteer travelling strictly on duty would be entitled to his fare at the expense of the Corps.

(b.) I would add to the above concession that of being permitted to travel by sea also under favourable conditions. There are many Volunteers in India to whom a free passage to England, or a passage under certain circumstances in a troop-ship, would be regarded as a substantial recognition of some years of voluntary service, and many would be willing and able, in return, to undertake duty on board. I am aware that this arrangement is not feasible under the regulations which at present govern Her Majesty's Indian Troopships, but it is well known that at times these ships return comparatively empty, and on those occasions permission might be accorded to deserving Volunteer officers and men to travel by them.

(c.) Again, in the matter of taxation, I do not know of any Imperial tax which at present affects the pockets of the class of men who join our Volunteer Corps, but should any such taxation be hereafter deemed necessary some concession might be made in favour of Volunteers. Even now there are in most towns certain municipal taxes which it would be a graceful act of the Municipality to remit in their favour.

As one I would note the wheel-tax, which is not levied from officers and soldiers resident in cantonments. The sum remitted may be insignificant, but the principle would be gratefully acknowledged as a mark of distinction to members of the Corps.

(d.) Again, connected with this matter, I may mention another direction in which the poorer class of Volunteers might be assisted. Attendance at parade in many stations means a walk of two or three miles and an hour's incessant marching over ground still wet with the morning dew, and as men in receipt of small salaries cannot afford any but the commonest native-made boots, their expenses on account of leather every drill season is really considerable. I think Volunteers should be accorded the privilege of being permitted to purchase ammunition boots at the same price as they are sold to the British soldier. This would enable them to procure an article not much, if at all, costlier than what they at present use, but which would be more acceptable on account of its more lasting quality. Beyond the question of economy to the men, it may be added that good, strong, well-fitting boots are as important towards the proper setting-up and steady marching of the soldier as any other article of his equipment.

(e.) And, lastly, under this head, I think it only reasonable to expect that Municipalities should contribute something towards institutions connected with our Volunteer Corps. This, I know, was not contemplated by the Municipal Act, and does not altogether therefore depend on the pleasure of those corporations. But at the same time I would urge that a well-organized body of Volunteers would, in time of trouble, be of the greatest assistance in protecting municipal property, besides at all times being a local object deserving of every encouragement.

IV.—There are still two points more which I would like to mention which, in my opinion, would tend to add to the popularity of Volunteering in this country.

The first is that some concession should be made to Volunteers who are anxious to secure rifles for their own permanent use or even for sporting purposes. The orders in this matter, as contained in para. 981, page 176, of the Bengal Army regulations, are, I presume, applicable to members of Volunteer Corps,—and Volunteers, like soldiers, can neither use their Government rifles for sporting purposes nor take them away when they leave the station at which they were issued. These orders are no doubt most necessary, and I do not ask for any modification of them in favour of Volunteer regiments: but at the same time many Volunteers, I feel sure, would gladly purchase the Henry-Martini rifle, in lieu of having it issued to them by Government, if they were allowed to do so on favourable terms, and I think such a concession would not only add popularity to the movement, but would also be productive of much good to the Service.

It is a matter of no little importance to a “good shot,” to know and thus be able to rely on his rifle thoroughly, and this cannot be secured if a man is liable to have his weapon frequently changed and ultimately taken away from him when he leaves; and further, there is no doubt



that sport is calculated to improve a man's shooting just as much, if not more, than firing at a target. In skirmishes, especially, the shooting closely resembles what a man would acquire experience of by occasional days in the jungle. The concession I ask for is this:—On the recommendation of the Commandant, and, if necessary, of the General Commanding also; a Volunteer might be allowed to purchase a rifle of the kind issued to his Corps, to be used by him on parade and for any other purposes he may wish. So long as the owner remains a Volunteer in any part of India let him retain that rifle; but in the event of his ceasing to belong to any Volunteer Corps, or dying, the rifle might either be sold to another Volunteer (with the consent of his Commanding Officer), or in the event of a sale not being effected, it might be taken back by the nearest Arsenal at a valuation.

V.—The second point I would recommend for consideration is that, on the occurrence of suitable opportunities, some practical use should be made of the services of the Volunteers in this country. Few things weary men of Volunteering so much as the same round of drill season after season. After a time they begin to question, in their own minds, the utility of the movements, they become disheartened, and they fall off in their regularity of attendance. Their delegation on some useful duty, very occasionally though it might be, would cause a popular break in this monotony, and would make them feel that after all they are of some value to the State. This might be effected by their employment, in lieu of the police or military, in the suppression of religious or political tumults of a local nature, or by their being permitted to take up some of the military duties of a station when the regular troops are under relief, or in cholera camps, or temporarily withdrawn for employment, on active service. These occasions are not frequent, but they would serve a very useful purpose by calling the services of the Volunteers into practical use. Such a time occurred in a few stations during the Afghan war, and the Volunteers were not a little disappointed that their willingness to assist the Government was never in those days put to the test.

### *Volunteer Officers.*

The subject of Volunteer Officers I have left till the last, but it is by no means the least important on that account. A Corps commanded throughout by a set of good, earnest, influential officers is a corps with an established reputation for efficiency. But it is exceedingly difficult to secure this valuable ingredient in the constitution of a Volunteer battalion. Officers who are efficient on parade are often devoid of official or personal influence over their men, and, on the other hand, officers of good position and influence are often callous about their drill and other Volunteer duties. I believe the remedy for this is to cancel the present arrangement, under which the election of officers rests with the members of a Corps. In the first place I feel sure that men as often as not select for these posts either their friends in office or persons who have the reputation of being "good fellows" socially, their zeal and interest in the Volunteer movement, or their fitness to command, being a matter of little or no consideration. And, secondly, Volunteers anxious

for preferment to the commissioned ranks establish a system of private canvassing, and in that way secure a large number of votes, chiefly from the many who have but little interest one way or the other in the selection. All this, of course, tends to lessen the probability of our possessing an efficient staff of officers.

As a matter of fact the Commandant is not only the best judge and really the most interested in these elections, but also his choice is far more likely to give satisfaction to the Corps generally than selections made by the men themselves. He would at any rate choose, as officers, men who have acquired a good knowledge of drill and displayed interest in the Volunteer movement—men whose orders off and on parade the lower ranks would respect, and whose lead in action they would follow with some confidence. These desiderata are not secured under the present system, where the personal friend, the popular official, or the energetic canvasser is often the successful candidate for these responsible posts.

But if this suggestion could not be complied with in full, I would urge that, at any rate, the *promotion* of officers may be left entirely to the Commandant, the men's selection being confined to the lowest appointment in the commissioned ranks. The delegation of so much patronage to Commandants is advisable, in order to secure for them the certainty of having really efficient and reliable officers in command and second-in-command of the different companies of their Corps. This system has, I believe, prevailed for some years among the Volunteers in England.

Having secured a good body of officers, I would ask that, in cases where social differences render it necessary, their position should be raised. Men who have been selected for these important posts should be regarded in the same light as officers of the regular army. They should be invited to levées, and although some of them from their social position would not care to mix in a circle beyond their own, yet they should at any rate have the compliment of an invitation to gatherings and entertainments of an official or semi-official nature. Such, and a few other like thoughtful attentions, would be pleasing to the officer himself, and would tend to raise him much in the estimation of the men whom he has been elected to command.

In behalf of the officers of Volunteer Corps I would suggest one more concession. Government have from time to time bestowed unattached commissions in the army in recognition of the good military services of private individuals. It would form a very great incentive to a regular and zealous performance of his duties if such an honour were, if only very occasionally, conferred on a Volunteer Officer as a reward for conspicuous gallantry, or in consideration of a long meritorious service in times of peace. Under G. G. O. No. 204 of 1876 commissioned Volunteer officers are on retirement allowed to retain their rank and also the privilege of wearing uniform; but the retention of mere Volunteer rank would be of little benefit to them socially, and for this reason I would suggest the bestowal of an unattached commission. The instances in which it could be earned should be exceedingly rare, and on that account the honour would be all the more prized.

One other point. I also think that the claims of Volunteer officers to salutes from soldiers of the army might with advantage be more clearly impressed on the military services. As often as not soldiers do not salute officers of Volunteer Corps in uniform, and officers are naturally very sensitive on this point. In section 102 of the Bengal Army Regulations such compliments are held binding on guards and sentries, but in section 87 Volunteer officers are not specifically mentioned as entitled to salutes. This matter should be distinctly understood, as the absence of the compliment is calculated to detract from the dignity of their position, and to lower officers in the estimation of their men.

And now to conclude. There are one or two points more on which I would have dwelt had time and space permitted. The question of uniform is one, in the eyes of some Volunteers, a matter of great importance. On this question my views are in favour of loose suitable grey clothing for ordinary wear and tear, and French grey cloth (with battalion facings) for full dress. Care should be taken that the helmets are constructed of light material and at the same time afford good protection against the sun. There is also the matter of Head-Quarter Stations, which, beyond affording accommodation for the arms and accoutrements, should be available also as a sort of Volunteer Club, where sociability could be promoted among all members of the Corps.

But this and many other things would follow from the whole movement being put on a properly organized and on a popular footing. That organization can best be effected by constituting a Volunteer Department of the State, and placing it under the charge of an active, interested, and influential officer: that popularity can best be secured by a ready bestowal of some, if not all, of the concessions I have named.

Great is the necessity and great would be the advantage of according some attention to the present and future of Volunteering in India on the lines sketched above. At present it all means but little more than the yearly expenditure of some lakhs of rupees in aid of a Civilian Rifle Association. If so much money is to be spent, it may as well be spent on something real, something of more assured benefit than Volunteering is in these days. To secure this the whole question should be thoroughly discussed, and all available information and experience brought together and carefully considered. This, perhaps, can best be done by a Commission. And if such a Commission is ever assembled, let it not consist of disinterested Officers or favoured Civilians *only*, but let it consist largely of Volunteer Officers of hard-earned experience—men who, with no hope of reward beyond the sense of a cheerful performance of duty, have laboured earnestly in the cause of Volunteering, and by so labouring cannot fail to have recognized all its defects and to have acquired a thorough appreciation of all its wants.

### III.

## THE VOLUNTEER FORCE OF INDIA,

### ITS PRESENT AND FUTURE.

BY  
CAPTAIN F. R. BEGBIE, 1ST SIKH INFANTRY,  
*Adjutant 1st Panjab Rifle Volunteer Corps.*

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*"In Deo Confidentia."*

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#### PART I.

#### THE VOLUNTEER FORCE OF INDIA—ITS PRESENT.

Holding India as the British undoubtedly do, at the point of the sword, there is a greater necessity than in England for men of European descent to know how to defend themselves and their hearths, should occasion arise. And knowing this, one might well expect that in India the Volunteer Corps would have a reality and a spirit about them, wanting in the same bodies at Home. But what are the true facts of the case? In India, the Volunteer movement is a feeble, lifeless effort, compared with what it is in England. There are, it is stated, in this vast empire, some 600,000 men of European descent—and of this number little over 7,000\* are enrolled as Volunteers in Bengal—that is, about 1 man in 85 is a Volunteer! Considering that it is twenty-two years since the Volunteer force was first recognised in India as an organized body, this small number of members proves that there is something radically wrong in the system. Of course there exist causes in India which certainly act as a drawback to the thriving of the movement. There is first the climate, which has an enervating effect, and makes men, after a long day's work at the office or at the mercantile desk, little inclined to shoulder their rifles, and be knocked about on parade. Next, there are few opportunities for taking part, as in England, in public ceremonies. There is no yearly meeting like that of Wimbledon—no Easter Monday Review, with its concomitant attractions of an outing and a pic-nic on a large scale. But the main deterrent cause is, undoubtedly, the want of encouragement on the part of Government and its officers. Until the advent of the present Viceroy, little or no recognition was bestowed on the Volunteer force. Even now, although Lord Ripon has interested himself in the matter, few of the officials, high in power, have followed his lead. Many of these consider that they have shewn sympathy enough with the movement, when they have given their annual prize to be shot for. This is certainly something, but a more personal and active interest is what is required to have any real effect. Some officials look on the force with

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\* According to Army list corrected to 31st December 1882.

contempt as an utterly useless body; others are simply apathetic, and take no action for, or against, it. Others, again, view it with actual disfavor, and do their best to discourage it. Men such as these last, if they should be in high official position, can do much to discountenance subordinates joining in the movement. These causes from without are sufficient to account for much of the moribund state of Volunteer-ing. There are also many minor causes, the remedy for which lies with the Volunteers themselves. There is a lack of enthusiasm, which is probably a reflex of the already mentioned discouragement by their superiors. The fitful attendance at drills which is so general has a very disheartening effect both on officers and on men. Large numbers of Volunteers merely put in their minimum number of drills just when they please; as these are only nine in number, and may be distributed over a period of seven months, it follows that there are rarely enough men on parade for any practical work. It has been my experience to have fourteen men out of a possible two hundred attending a battalion parade, and on occasions when company drill has been ordered, the numbers have been from six to eight! It was impossible of course to carry out the objects for which the parades were ordered. This small attendance acts as a damper on those who do come, who naturally enough think that next time they will be wiser, and not attend either! Want of punctuality is another great drawback. Men who come punctually have to hang about till the unpunctual ones arrive, as, until there are a sufficient number, the parade cannot be formed up, and in this way unpunctuality is disseminated. There is also a want of discipline which I will touch upon under its own head. These various causes combined account, quite sufficiently, for the Volunteer force having made no very great progress since its organization in 1861. How these causes may be remedied, and the Volunteer movement be vitalised will, I think, be best shewn in the second part. "The Volunteer Force of India—its future."

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## PART II.

### THE VOLUNTEER FORCE OF INDIA—ITS FUTURE.

It will be admitted on all sides that in an alien country like India, it is incumbent on every male of European descent to gain a thorough knowledge of the use of the rifle, both for his own and his neighbour's protection, and for the maintenance of the British Government, upon which depends the safety of the lives and property of himself and other Europeans. The fact, however, seems hardly to have dawned on the minds of the European community, and it is therefore of the highest importance that no time should any longer be lost in arousing them to a sense of it. If it be the wish of Government that the Volunteer movement in India should develope into greater proportions, there are two ways of effecting it. The one is by ENCOURAGEMENT, the other by making VOLUNTEERING A CONDITION OF GOVERNMENT SERVICE. The former should be given a fair trial, and if it does not succeed, then, and then only, should the latter be resorted to.

*Encouragement.*

There are many ways of encouraging the movement, all small in themselves, but their effect in the aggregate would be great. If, for instance, more appreciation of the movement were shewn by Government, if Volunteers were made to feel that Government recognised them as important factors in the defence of the country, if a sort of *camaraderie* were fostered between the Regular and the Civil force, it would make a very appreciable difference in the status of the Volunteer, and would have a very happy effect on the recruiting of the force.

Government Officials should take an active interest in the movement, and should join it as far as practicable. Their example would have a great influence on those able-bodied Europeans who are now hanging back. It cannot be expected that men who do all the drudgery of office, or who have hard manual labor to perform, can be enthusiastic over a subject which is almost ignored by their immediate superiors. The plea, "no time," which is so often urged by officials, is equally, if not more, applicable to the subordinates of the various departments, who are not slow to take the cue from those who they see find time enough for attending places of amusement, though none for the parade ground. What an impetus would be given to Volunteering if heads of departments would only join the movement! Their subordinates, from policy, if from no higher motive, would speedily follow their lead, and be worked up into fresh zeal by the desire to please those who had their worldly prospects in their hands. There would be no difficulty then made about leave from office, or from the workshops, to attend parades. Every official would be ambitious to make the Corps, of which he was a member, one of the best and strongest, and would try to induce the non-Volunteers under him to join. He would also be able to influence, materially, the regular and more constant attendance at drill. The various advantages could easily be enlarged upon, but they must be so very apparent that I need not do so. The whole question of Volunteering hinges upon those in power setting a good example by becoming Volunteers themselves, and by taking an active and warm interest in the movement. Without this active support, Volunteering will be but a sickly plant, now and then giving hopes of renewed life and vigor, only to become more fruitless and feeble after its few attempts at spreading forth.

*Volunteering a condition of Government Service.*

Admitting that it is incumbent on every male of European descent to gain a knowledge of the use of a rifle for his own and the public weal, it naturally follows that if the community does not awake to this fact by joining the Volunteer force, it is the duty of Government to bring home this necessity to their minds. This could easily be done by making Volunteering a condition of Government employ. There is no hardship involved in the matter; there is really no compulsion about it. It is not as if Government were to say "You *shall* serve us, and you *shall* be a Volunteer." All that Government need say is—"You seek employment under us. One of our conditions is,

that you are to enrol yourself in the Volunteer force, for your own protection and that of your neighbours, and in support of us your masters. You are free to accept them or not as you please." Where would the compulsion in such a case be? It might be urged that Government servants would be under a disadvantage compared with those employed by private Firms or individuals. If Government, however, were to pursue this system with all its servants, Banks, Merchants, and other employers of private labor, recognising the great necessity there exists in this country for every able-bodied male to carry arms, would undoubtedly follow suit. The "condition of service" must first emanate from Government, and would then be quickly followed up by all other employers of private labor. This "condition of service" is scarcely "Volunteering by compulsion," although it has already been so called, and being a convenient catchword, has been taken up by a few. —(Of course if the system were adopted, consideration would have to be shewn to those now in Government employ who accepted office when such conditions were non-existent).

In time, if Government has reasonable proof that in spite of encouragement, in spite of inducement, a large majority of able-bodied Europeans are still holding back, indifferent alike to their own and their neighbour's fate, and regardless of the maintenance of the supremacy of the British Government, this condition of service will have to be adopted in self defence.

If Volunteering were made a condition of Government service, it would be necessary to raise a Militia Force, in which service for all non-Volunteers, who were able-bodied, would be *compulsory*. A Militia force, if properly organized, would be a very valuable innovation. There is ample material for it in India, and the men being all acclimatised, would bear the hardships of campaigning better than the newly imported British soldier.

Militia Regiments would be more economical than British Corps in every respect. A few regiments might be started in the Presidency towns as an experiment, and, if successful, they could be organized in other stations where the European and Eurasian element is large.

As this essay is however purely on the subject of the Volunteer Force, I must not wander from it.

#### COMMISSIONED OFFICERS.

The subjects laid down in para. 65 of the Volunteer Regulations embrace all that a Captain or a subaltern need know for the efficient working of his Company, but the examination is not as thorough either practically, or theoretically, as it might be. There is too much desire on the part of the Board to allow Volunteer officers to pass, consequently a high standard of attainments is never reached. Hence, it comes that there are a number of Volunteer officers who know just enough to scrape through the lenient examination, and, as they seldom look at a drill book subsequently, their attainments never increase. These officers are a detriment to the Corps. Volunteers do not care to turn out for parade under an officer who knows but little of his work, and

who, time after time, puts them through the same manœuvres. Much depends upon the officers, for they have it in their power to make their companies efficient or otherwise. Zeal on the part of an officer soon infuses itself into the members of the Corps.

Particular care should be given to the selection of officers. Officers who do their minimum number of drills and who get through their class firing any how, but seldom appearing on parade, are not the kind wanted. Officers of this description do a great deal of harm to their Corps, and should, without any compunction on the part of the Commanding Officer, be called upon to resign their commissions.

Officers who fail to pass the necessary examination within a year of their appointment, should also be *obliged* by Government to resign their commissions.\* I feel sure that were a few officers to be gazetted out for this reason, it would produce a salutary effect on the remainder. As the Volunteer Regulations aptly say—"It cannot be expected that thoroughly efficient members of an armed force will be content to serve under the orders of officers who are incapable of commanding them properly."

Officers should be popular with their men: for this they require both tact and good temper. Their manner should savour more of the "*suaviter in modo*" than the "*fortiter in re*."—At the same time, I think, Volunteers will stand a good deal of *brusquerie* from their officers, provided they are men full of zeal, well up to their work, and really anxious to make their companies efficient.

I believe the elective system for officers to be the most popular with Volunteers. There should, however, be some little admixture of selection also. Officers should be chosen from among men in a position to spend some money on their companies. Those who do this have always a good hold over their men, and get more out of them.

With Railway Corps, the Officers should be selected from the controlling officers of the Railway, who would thus have an influence over their men. Personally, I would like to see all Officers selected from the heads of departments, and I think the election of these would be certain, were they to offer themselves as candidates. A Volunteer Officer, of very old standing, writes to me as follows on the subject.—"I am of opinion that the Civil heads of Departments should alone command the Volunteer force, *i. e.* the head of a Department should command a company mainly composed of his own men; his subaltern officers being junior departmental officers of the superior grades. This is a necessity, for a Volunteer Officer has no power in his military capacity, and can only influence the men through his civil rank. This is an anomaly, and an absurd one, but it exists."

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\* The Volunteer Regulations direct that Officers who fail to pass the qualifying examination within two years of their commissions are to be "requested to resign their commissions." Unlike the famous picture in Punch, there should, in an important matter as this, be a little more of the "order," and a little less of the "request." (Two years is too long a license. A year is sufficient). A study of the last Quarterly Army List will shew that there are several officers, of more than two years' standing, who have not passed, including two whose commissions bear dates of 1877 and 1878 respectively.



### NON-COMMISSIONED OFFICERS.

Much that I have said on the subject of Commissioned Officers applies equally to non-commissioned officers. I fear these are often selected without much reference to their qualifications, or aptitude for the post. A lazy, apathetic, non-commissioned officer does more harm than good, and his services should be dispensed with as soon as possible. I consider that the best way to obtain good non-commissioned officers is for the Adjutants of the Corps to examine candidates. Only those who pass a satisfactory examination should be promoted. Another system, which I should very much like to see inaugurated, is that every non-commissioned officer should have directly under him a certain number of Volunteers. These men ought to be those whose homes are adjacent to his. He should be held responsible for the instruction of his section in musketry principles, and for their regular attendance at parades and target practice. If some such system were devised (it would not be very difficult), non-commissioned officers would have something to interest them, and to encourage them to vie with one another. At present, non-commissioned officers have little or no active part to play in the Corps, and are, as far as my experience goes, the worst attendants at parade that we have, and this may account for it.

### LOCAL LIMITS OF SERVICE.

The present local limit of service for Volunteers might well be extended from 4 to 10 miles. I would not suggest a larger increase than the latter distance, for naturally the Volunteer in times of disturbance would not care to be far from the place where his family is, for it is for their defence partly that he has enrolled himself. Besides, the difficulty of transport would render any greater extension practically useless. A 10 mile limit, however, is within marching distance, which would do away with the transport difficulty. It is not probable that Volunteers would be employed even at that distance from their homes except very temporarily. Although a Volunteer's first duty is undoubtedly to the State in troublous times, it should be borne in mind that the protection of his family is, in his eyes, of paramount importance to him.

Railway Volunteers, on the other hand, should be liable for service along the whole length of their line.

### DISCIPLINE.

The weak point in the Volunteer system is the want of discipline. There is absolutely no way of punishing a volunteer, unless he commits some offence heinous enough for trial by Court Martial. Commanding Officers, Company Officers, and others are powerless to enforce orders, so the real master of the situation is the Volunteer himself. The hands of Commanding Officers would be much strengthened if Government were to authorise the publication, in local Government Gazettes, of the names of those Volunteers whom it might be considered desirable by the Regimental Commanding Officer, in the interests of the Corps, to strike off the rolls, for minor offences of discipline, or for not qualifying for the capitation grant two years in succession.

The whole standard of the Volunteer Force should be raised. It should be made the ambition of civilians to become Volunteers, not in name only, but in reality, and to be dismissed from a Corps should be considered a disgrace, instead of, as it sometimes is, a welcome release.

From what has come under my own observation, it is evident that it is the Volunteer, and not his Officer, who has the whip hand. The Volunteer who attends drill at rare intervals, the unpunctual, the untidy one, is not reproved by his officer for fear of his immediately resigning, and his capitation grant being thus lost to the Corps. "Resignation" should not be continually wielded by the Volunteer as a threat whenever he considers his *amour propre* wounded. Such threats should be able to be met with the counter threat of his being struck off the rolls of the Corps, and his name submitted for publication in the local Government Gazette. This would give Commanding Officers a hold over their men which they do not now possess.

It should not be left optional, as now, to the Volunteer to make himself efficient. It should be distinctly understood that in the event of a Volunteer not qualifying for the capitation grant, he will be called upon to make good the sum to the Corps. This has lately been enforced in England with good results. There is no hardship in the case, as the earning of the capitation grant is easily within the scope of every Volunteer, and the man who cannot, from whatever cause, manage to put in his nine drills, and fire his sixty rounds annually, had far better not belong to a Corps. "Paper Volunteers" are no good whatever; on the contrary, they do harm to the Corps.

#### ORGANIZATION.

Administrative Battalions should be formed in every station where there is a large European population. To these battalions all companies, and sections of adjacent outstations, should be attached. These sections might, in many instances, only consist of some half a dozen Europeans, but instead of being discountenanced, as at present, on account of their small numbers, they should be encouraged to enrol themselves, as in the event of any disturbance the residents of such small stations would have to seek refuge in some central spot for defence. In such a contingency, every trained Volunteer would be an invaluable addition.

There should be more Sergeant Instructors attached to Administrative Battalions, with a view to their visiting these outstation sections, to instruct them in musketry, and to put them through their annual course of ball practice. Drill would, of course, with such small sections, be impossible, but this need not signify, as it is of small importance as compared with the knowledge of the use of the rifle. The drill can be left for the time when they are called in for the annual camp of exercise (see section "Drill"), or omitted altogether.

#### *Staff Non-Commissioned Officers from the Army.*

Volunteer Corps are, under existing rules, at a great disadvantage in obtaining good Non-Commissioned Officers from the Army as drill instructors. Sufficient inducement is not offered to make good men come

forward for the appointment, consequently, a second-rate lot have to be put up with. There are, however, exceptions to this, as to any other rule. None but the steadiest men should ever be sent as Instructors to Volunteer Corps.

There are a great many sources of temptation, and only steady men have any chance of keeping straight. There is little or no supervision over them, and the absence of discipline, such as they have been accustomed to in their own Corps, is likely to have a baneful effect on them. Non-Commissioned Officers who misbehave themselves should be tried by Court Martial, reduced, and sent back to their regiments. It will scarcely be credited, but it is nevertheless a fact, that although instances of misconduct on the part of Non-commissioned officers have been brought to the notice of the military authorities, all that has been done to the offenders, has been a simple remand to their regiments !

The Sergeant Instructor, if he possesses tact, has it in his power to popularise drills. For this reason he should not be of the type that, "clothed in a little brief authority," sets about ordering every one in a rough, dictatorial manner. Such a style does not answer for Volunteers. What is wanted is a sharp man, well up to his work, able to impart instruction in an intelligent and pleasant manner, and not in the mechanical way many Sergeants do, who have learnt the drill book by rote, and who, without a pause from beginning to end, holloa out the instructions as if they were all strung together.

As the Squad drills for recruits are so few (only ten in number), it is obvious that, if anything is to be taught by such a limited amount, the instructor must be a man of patience and intelligence, who thoroughly understands his drill, and is able to impart instruction in other words than the usual parrot-like formula. The least barrack-room roughness will have the immediate effect of diminished attendance at recruit and other drills, so it is a matter of great importance that the Sergeant Instructor should be a selected man. The appointment, as it now stands, does not offer inducement sufficient to attract the best men. There is nothing for them to look forward to ; no promotion to the warrant grade in store for them, and they are worse off in this respect than those who either remain with their regiments, or accept other departmental employ.

The pay of all regimental and departmental non-commissioned officers in India has been increased since the 1st July 1881, but that of Sergeant Instructors of Volunteers has remained stationary. This should be remedied at once, and the Sergeant Instructor of the Head Quarter Companies of an Administrative Battalion should have the rank and pay of a regimental Sergeant Major. This would be something for the other Sergeant Instructors to look forward to, and work up for, and would act as an incentive to greater zeal and steadiness.

The pay of "Drill Instructors" should be raised to at least Rupees fifteen *per mensem*. It is utterly impossible to get men for eight rupees *per mensem* (the allowance granted by para 134 of the Volunteer Regulations),—the same amount as that granted by Government to lascars.

The pay of second-class Sergeant-Instructors should, in like manner, be 20 rupees instead of Rs. 14 as now.

#### ARMS.

The permission accorded in the Volunteer Regulations to Members to keep their arms at their own residences, is a mistaken one. The only advantage that I can see is, that in the remote contingency of an *émeute* occurring, Volunteers will have their rifles by them, ready for action. The disadvantages are numerous. The rifles are never kept in such good order as they would be in an armoury. They are often used by their owners for sporting purposes, and are extremely dangerous to the public in that capacity, owing to the great distance Martini-Henry bullets travel. (I am informed that many men join the Volunteers solely with the object of obtaining a good rifle to use for sporting purposes, and my experience confirms this idea). The rifles are, at times, taken away from the station, and are thus altogether lost sight of. (I had great difficulty in tracing two rifles which had been taken away by Volunteers when leaving the Corps, without permission, and which were recovered only some eighteen months afterwards). The rifles are liable to injury when kept by Members at their private residences. They are more likely to be stolen, and in every way, the retention of their arms by Volunteers at their private residences, is a mistake. During my short experience, I have had an instance of a Martini-Henry rifle being cut down by a Volunteer for sporting purposes! Quite recently, a Martini-Henry rifle was borrowed from a Volunteer on the pretext of being wanted for sport, and sold for Rs. 150 to a native, who again sold it to a Trans-border man for Rs. 225! In searching for this rifle, we came across three others belonging to another Volunteer Corps. All four were cunningly stowed away in a bundle apparently containing cotton, and had been actually sent to the railway station, ready for despatch, when they were fortunately recovered! There are many needy Volunteers in the ranks, to whom a sum of Rupees 100 or 150 for a rifle would be a small fortune. They have only to dispose of them as the four rifles just mentioned were disposed of, and then report that they had been stolen from their quarters, and who can prove the contrary? They would have to pay something under rupees forty for a new rifle, and would pocket the difference. I do not, however, wish to cast an aspersion on the Volunteers as a body by saying this. The very large majority of them would scorn to dispose of their arms at any price. There are some, however, (as has been already proved) to whom the offer of a good price for a comparatively cheap weapon, would be a temptation not easy to withstand. As Government is anxious that arms of precision should not find their way across the border, it is necessary that their liability to be either stolen or sold, should be minimised, and this would be best effected by storing them in "Bells of Arms." Every company should be provided with an Armoury, or Bell of Arms, which should be built contiguous to the Sergeant-Instructor's quarters, which again should be conveniently situated with regard to the parade ground. Unless some such means

are provided, and the arms be invariably so kept, many rifles will be stolen, and will eventually find their way into the hands of the Border Tribes. I would most strongly urge that Bells of Arms be provided, for the usual way in which Volunteers keep their rifles is in a corner of their rooms, from whence they can easily be carried off. If it is necessary to use great precautions amongst regular troops for the safe custody of the arms, where there are always some soldiers about the barracks, surely greater precautions are necessary with Volunteer Corps? When a Volunteer is absent from his home, the abstraction of his rifle is no difficult matter, either with, or without, the connivance of his servants. It is only quite recently that native dealers in arms have turned their attention to Volunteer Corps, and the facility with which some rifles have been obtained, will induce them to persevere in their new field of enterprise.

In stations where there are only a few Volunteers, it would of course be impossible to provide "Bells of Arms." There, however, would not be the same necessity for them as in stations where there are a large number of Volunteers. The community being small, the arms could be entrusted only to well known men, and their safety be arranged for amongst the Volunteers themselves.

#### AMMUNITION.

The allowance of 100 rounds of balled, and 60 rounds of blank ammunition annually might, with advantage, be increased to 150 rounds of the former, and 100 rounds of the latter.

The 150 rounds of balled ammunition should be used as follows:—

|                              |     |     |            |
|------------------------------|-----|-----|------------|
| Annual course (class firing) | ... | ... | 60 rounds. |
| Volley firing                | ... | ... | 20 "       |
| Independent firing           | ... | ... | 15 "       |
| Skirmishing                  | ... | ... | 15 "       |
| Match and practice purposes  | ... | ... | 40 "       |

TOTAL ... 150 "

It is not an uncommon practice for Volunteers who find that they are not shooting up to their usual mark during their annual course, to withdraw from it, purchase ammunition, practice on their own account, and having perfected themselves, go on once more with their class firing. Many of the poorer Volunteers can neither purchase ammunition for such a purpose nor for matches. Were 40 rounds per man allowed for these purposes, there would be a marked improvement in the shooting of those who just fire their annual course through, and not being able to purchase ammunition, can get no other practice. The 50 rounds for volley, independent, and skirmishing purposes might, at the option of the Commanding Officer, be either partly, or wholly, used for firing at moving and at disappearing objects.

The blank ammunition should be increased to 100 rounds per man, as the present allowance of 60 is too little. Nothing attracts Volunteers more than field days with blank ammunition, and by increasing the number of blank cartridges, the number of skirmishing parades

with blank firing can be proportionately increased, and more drills got out of the Volunteers.

The ammunition should be kept in store, and not in the private possession of Volunteers. Considering the stringent orders in the regular army as to the safe custody and preservation of ammunition, it is unintelligible how the Volunteer Regulations should authorise practice, and especially *service*, ammunition being kept in the possession of Volunteers (paras. 184 and 185). Ammunition kept in this way cannot but deteriorate, and deteriorate very rapidly too, to say nothing of its liability to be stolen. Martini-Henry rifles without their own ammunition are of no use to Afridis, and as the cartridges cannot be manufactured by them, it naturally follows the demand for these must be met by stealing them also.

#### CLOTHING.

One of the greatest sources of expense to individual Officers, Volunteers, or to Volunteer corps, is the uniform. Volunteers are constantly being transferred from one station to another owing to their civil duties. Their uniforms in such cases of transfer are useless to them, owing to each corps having its own distinctive color. In corps where Volunteers are fitted out with uniform at the expense of the Capitation grant, this does not so much matter, as in cases of transfer they leave their uniforms behind them, and are provided with new ones by the Corps in which they next enrol themselves. The system of paying for uniform out of the Capitation grant is not however universal, and where it is not, the expense must fall on the individual, who either pays out of a pocket that can little afford it, or ceases to be a Volunteer. On officers, who have always to provide their own uniform, this falls especially heavily. It would be a great saving of trouble and expense were there one uniform for all Volunteer Corps in India, the facings of different corps only being different. Of twenty five Corps that give in the Army List the color of their uniform,

|   |      |              |
|---|------|--------------|
| 9 | wear | Green.       |
| 5 | "    | Rifle Green. |
| 3 | "    | Scarlet.     |
| 2 | "    | Drab.        |
| 2 | "    | Grey.        |
| 1 | "    | Khaki.       |
| 1 | "    | Blue.        |
| 1 | "    | Brown.       |
| 1 | "    | Black.       |

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TOTAL 25

Although Green and Rifle Green are the predominating colors, and an adoption of either one or other as the universal color for Volunteer Corps would involve the least expense, I question whether for India it is as suitable, or as serviceable, a color as drab. As neither the Capitation grant, nor individual members can afford to pay for two uniforms—one for show, and one for service—the one most suitable for the latter should be selected.

## DRILL.

The drills of Volunteer Corps should not be too frequent. A custom of having a daily parade of some sort exists in certain corps, with the object of catching Volunteers on the days most convenient to them. The consequence is, that for most parades, so few men turn out, that manœuvres of even an elementary description can hardly ever be tried. With a smaller number of parades during the month, I think the attendance on parade days would be much larger than it is when they are almost of daily occurrence.

Camps of Exercise should be assembled annually at some central position, convenient to all the outstation companies and sections of the Administrative Battalion. Government has very liberally sanctioned free rations, camp equipage, and barrack furniture for all Volunteers taking part in Camps of Exercise. It would add much to the success of these Camps, were a week's leave granted to all Volunteers desirous of joining them. Free passages by rail should also be given. As holidays are granted at Christmas, it is surely not too much to ask for a week's leave during spring for the purpose of collecting our defenders, and working all the members of a battalion together? This would, besides, afford an opportunity for those Volunteers of outstation companies or sections to join in manœuvres which, from the smallness of their numbers, they could not before be exercised in.

While advocating the assemblage of Camps of Exercise with the object of bringing all the members of a battalion together, and of attracting large numbers to participate in the evolutions, and thus benefit themselves and their officers, I would, at the same time, deprecate the various attempts that are made to expect from Volunteer Corps the steadiness, and the exactitude of movements, of the Regular Army. Much valuable time is thus wasted, as it is impossible in the nine drills to inculcate any steadiness or exactitude. The Volunteer, in my opinion, should be, *par excellence*, a skirmisher. With his good shooting powers, and his intelligence, he would be invaluable as a skirmisher, or as a scout.

The prescribed number of drills are, as I said before, insufficient to perfect him in close order (as opposed to loose order) movements, but he could, in the same period, acquire a better knowledge of skirmishing. In that time he could be taught fairly well all the important duties of a skirmisher,—how to take advantage of cover, to keep up a steady fire on the enemy, to exercise his powers of observation, and report every circumstance, which, though insignificant in itself, might be of great importance to a General. If, in addition to this, he could have a knowledge of out-post duties and of military signalling, he would be infinitely more valuable on active service than if merely brigaded with regular troops.

The minimum number of drills for the efficient Volunteer might, with great advantage, and without much inconvenience, be increased from 3 battalion drills to 6, and from 6 company to 9, making a total of 15, instead of 9 drills, as at present. For the recruit, the standard

need not be increased as the number of drills (30) is about as much as he can conveniently, with reference to his civil duties, manage to accomplish in one season.

#### CAPITATION GRANT.

I now touch upon a subject about which there is much diversity of opinion. There have been many advocates for the increasing of the Capitation grant to something very nearly double what it is. From the experience I have gained of the working of a Corps' accounts, I consider the grant of Rs. 20 for an efficient, and Rs. 30 for an extra efficient Volunteer to be sufficient (in a well regulated Corps where the funds are carefully administered), if it be relieved of certain charges at present defrayed out of it. These are—

- (a). Payment of postage and of telegrams.
- (b). Construction of rifle ranges.
- (c). Pay of native establishment.

The outlay in postage and telegrams should, as in regular Corps, be borne by the State. Rifle ranges should, in every instance, be constructed at the expense of Government, at every station where there is a Company of not less than thirty Volunteers. All the accessories of a range should, at the outset, be supplied by Government, and afterwards kept up out of Corps funds. An establishment of one lascar for a Company of 30, and two for a Company of 60 and under 80, should be provided by Government, as range markers, and for the general care of arms and accoutrements.

Instead, therefore, of increasing the Capitation grant, I would suggest the aforementioned charges being paid by the State, as some such assistance is required. If Government were to sanction the above proposals, there would not, as far as I know, be any necessity for increasing the Capitation grant. If some such help cannot be given, an increase in the Capitation grant, say of Rs. 5 per head, ought to be made to meet these contingencies.

#### INSPECTOR GENERAL.

The appointment of an Inspector General of Volunteers would not only popularise the Volunteer movement, but would have beneficial results in many other ways. At present, Volunteer matters receive but little attention from Government, and the great delay which occurs in obtaining any answers from Government regarding Volunteer questions, is often disheartening.

An Inspector General would be in a position to bring before Government matters vitally affecting Volunteers, and to obtain any necessary concessions. By continually moving about from Corps to Corps, enquiring into their wants, and shewing a personal interest in their welfare and development, he could infuse a new life into the movement.

An Inspector General of Volunteers for each Presidency would be required, and the appointment of such an officer would have an immediate good effect on Volunteering. It is to be hoped that this matter



of an appointment of an Inspector General of Volunteers for each Presidency, a post which has so often been advocated before, will no longer be delayed. If Government wishes to show that it takes a real interest in its Civil force, it cannot do better than appoint Inspector Generals. Without the appointment of such officers, the Volunteer movement can never be expected either to progress or flourish.

#### REWARDS.

As Volunteers undertake various onerous military duties, chiefly with a view to being a source of strength to Government in times of need, Government ought, on its part, to mark its appreciation of their services by granting them certain concessions and rewards. These might take the following shape :—

- (1). Officers to be eligible for rewards and distinctions as in the regular Army.
  - (2). Officers to retain their rank, and to wear their uniform on retirement, after a total service of ten years in the commissioned grades.
  - (3). Officers, and all grades of Volunteers, who have been extra efficient for ten consecutive years, to be granted non-regulation passages to England in Her Majesty's Indian troopships.
  - (4). Volunteers whose homes are in India, to be given a free grant of waste land, in lieu of passage to England.
  - (5). Officers, and all grades of Volunteers, to be permitted to travel by rail, *irrespective of duty*, one class higher than the fare paid by them. (To be limited to "Extra efficient" only).
  - (6). Medals for long and good service to be granted to the Rank and File.
  - (7). The Government allowance of Rs. 2 per head, granted at present to Railway Corps only, for prizes, to be extended to all Volunteer Corps.
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IV.  
MEDALS AND HONORARY DISTINCTIONS,  
GRANTED UNDER THE ORDERS  
OF  
*The Government of India.*

A PAPER BY COLONEL F. B. NORMAN, C.B.,  
*24th P. N. I.*

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EXPEDITION TO THE WEST COAST, UNDER BRIGADIER-GENERAL  
THOMAS GODDARD, 1778-1784.

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PART I.

In November 1772, the Peishwa, Madho Rao, died, and was succeeded by his brother Narain Rao. Nine months after his accession he was assassinated, as was supposed with the connivance of his uncle, Rughonath Rao, better known as Raghoba, who now assumed the vacant office. Raghoba immediately engaged in hostilities with the Nizam, whom he compelled to purchase peace by the surrender of territory valued at twenty lakhs per annum. He then marched against Hyder Ali but was recalled by news of a formidable confederacy which had been formed against him at Poona; at the head of which were the chief Ministers of the State. It appears that Gunga Bai, widow of Narain Rao, having been declared pregnant, the ministers determined to espouse her cause; and on the morning of the 30th January 1774, carried her off to the fort of Purundhur, and there formed a council of regency, consisting of Saccaram Bappoo, Nana Farnavese, and Hurry Punt, the Commander of the forces.

Raghoba hastened to meet his opponents, and defeated their army on the 4th March. Instead, however, of following up his victory by marching straight on Poona, he turned off to Burhanpur and thus gave his enemies time to reassemble their scattered forces. On 18th April, Gunga Bai was delivered of a son, who, ten days after his birth, was proclaimed Peishwa. Raghoba, after remaining a short time at Burhanpur, crossed the Nerbudda and was joined by Holkar and Sindia. He now advanced to the Taptee in view to securing the co-operation of the Gaekwar. Whilst here, he entered into negotiations with the Government of Bombay, for the purpose of obtaining the aid of the English to establish him in the Government of Poona. About six years previous to this, the Court of Directors had urged

upon the Bombay Government the advisability of obtaining possession of Salsette and Bassein,\* as it was hoped that their acquisition would bring to Bombay the whole of the trade of Persia and Arabia with the west coast of India. These settlements had been taken possession of by the Portuguese at a very early period, but had been wrested from them by the Mahrattas in 1739.

The President and Council at Bombay, foreseeing an opportunity of obtaining the places they coveted, readily listened to Raghoba's proposals, and agreed to assist him with all the troops they could spare, which amounted to about two thousand five hundred men, on condition that he would advance from fifteen to twenty lakhs of rupees, and, on being firmly established at Poona, cede to the English, in perpetuity, Salsette, the small islands contiguous to Bombay, together with Bassein and its dependencies. Raghoba, however, declined to give up any of these places, but offered to cede districts and claims in Guzerat, to pay six lakhs of rupees in advance, and one and a half monthly for the aid of one thousand Europeans, two thousand sepoy and fifteen guns.

Whilst these negotiations were progressing, information was received from the English agent at Goa, that the Portuguese had sent a formidable armament from Portugal for the avowed purpose of recovering their lost possessions. The Government of Bombay determined to anticipate the Portuguese, and on the 12th December 1774, a force of six hundred and twenty Europeans, including artillery-men, one thousand sepoy, and two hundred gun lascars, under command of Brigadier General Robert Gordon, and a naval force under Commodore Watson, left Bombay for Salsette. The day after the ships had sailed, a part of the Portuguese fleet anchored at the mouth of the harbour, and formally protested against the expedition. On the 28th December, Tannah was taken by storm, the Mahrattas fought gallantly and the loss of the English was great, Commodore Watson being amongst the slain; but, before New Year's day, the whole island was in the possession of the English.

By the Act of Parliament for regulating affairs in India, passed in 1773, the Government of Bombay became subordinate to that of Bengal, and Warren Hastings, Governor of Bengal, was appointed Governor General of India, with four Councillors who were nominated by Parliament. Raghoba's proposals had been made to the Bombay Government on the 6th September 1774, and as the members of Council had not arrived at Calcutta, the Bombay authorities considered

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\* The Court of Directors, in a despatch to the Bombay Government in 1768, expressed their desire to obtain grants of both places:—

"The intimation you gave to our President and Council of Fort St. George, to use their endeavours with the Mahrattas to obtain a grant of Salsette and Bassein to us, we highly approve of; and we now recommend to you, in the strongest manner, to use your endeavours, upon every occasion that may offer, to obtain these places, which we should esteem a valuable acquisition. We cannot directly point out the mode of doing it, but rather wish they could be obtained by purchase than by war."

that, as the Supreme Council had not been established,\* they could act, as heretofore, without reference to Calcutta.

The Council at Poona had in the meanwhile succeeded in detaching Holkar and Sindia from the cause of Raghoba, and collecting a force of 30,000 men marched against him. He had to retreat hastily, and narrowly escaped being seized by his treacherous allies and delivered up to his enemies. On the 17th February he was overtaken at Wassud, by the troops of the regency, and totally defeated. Accompanied by about one thousand horse he fled to Surat, where he found a force under Colonel Keatinge which had been sent to his aid. After some further negotiations, Raghoba, on the 6th March 1775, put his seal to a treaty, which is known as the treaty of Surat, and which was concluded without any reference to the Government at Calcutta. By this treaty, Raghoba undertook, in return for the aid of the British force, to cede to the East India Company, in perpetuity, Salsette, the islands of Kenery Caranja, Elephanta and Hog island, also Bassein and its dependencies, and to pay one and a half lakhs per mensem on account of the expenses of the troops.

Colonel Keatinge, having been joined by all the men whom Raghoba had collected, advanced towards Poona. On his arrival at Arras, on the 17th May 1775, he found the Mahratta army drawn up to dispute his progress, a desperate fight ensued, the brunt of which was borne by the British force,† numbering about two thousand five hundred. Victory for a short time was doubtful, but the Mahrattas at last broke, and fled in great confusion to the Nerbudda. They were pursued with vigour but succeeded in making their escape across the river, into which, however, they were compelled to throw their heavy guns. Commodore Moore had in the meanwhile completely crippled the Mahratta navy, consisting of six ships carrying from 26 to 46 guns, together with 10 smaller vessels. The Gaekwar, Futtah Singh, now hastened to enter into an engagement to aid Raghoba both with men and money. The campaign had thus been successful, but the prospects which this success opened out were ruined by the conduct of the majority in the Council at Calcutta.

This Council had been unanimous in condemning the treaty of Surat, and on hearing of the execution of the same, had determined to take the management of affairs with the Mahrattas into their own hands. For this purpose it was deemed necessary to send an envoy to Poona to open negotiations with the regency. Colonel Upton was the Officer selected for this duty. When intelligence however reached Calcutta that hostilities had actually commenced, Hastings considered

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\* The four Councillors were General Clavering, Colonel Monson, Mr. Philip Francis and Mr. Barwell. The three first landed in Calcutta from England on the 19th October 1774. Mr. Barwell was in India when he was appointed.

† Its strength was as follows, --European Artillerymen 180, Gun lascars 160, European Infantry 500, Sepoys 1,400. The Artillery consisted of twelve field pieces, two mortars and some howitzers, --see Forbes' Oriental Memoirs.

that sound policy dictated that the war should be prosecuted with vigour, until it could be brought to an honourable conclusion; and, as the Bombay Presidency was unable to bear the burden of the war without aid from the other Presidencies, he urged that it should be assisted with troops and money from Bengal. He was supported by Mr. Barwell, and opposed by General Clavering, Colonel Monson and Mr. Francis, and it was decided not to send any troops to Bombay but that a small sum of money should be sent. Shortly after this, the majority determined to put an end to the war, and notwithstanding Hastings' protests, that by doing so the success of Colonel Upton's negotiation was being imperilled, the Bombay Government was directed to withdraw the British troops from the field.

Colonel Upton had been greatly delayed in his journey and did not reach Purundhur, near Poona, until the 28th December 1775, and at once commenced negotiations with the regency. He was instructed to stipulate for the possession of Salsette and Bassein. The Mahratta Council not only refused compliance, but demanded the surrender of Raghoba and of all the territory acquired by the English, but offered, as a favour, to contribute twelve lakhs of Rupees towards payment of the expenses of the war. After much discussion Colonel Upton inquired of the ministers what was their final determination, to which they replied, that they knew of none but war.

This insolent reply aroused the indignation of the Council, and they now decided to support Raghoba and prosecute the war with vigour. This determination was arrived at on the 7th March 1776, under the impression that negotiations at Poona were at an end, but on the 1st April, a letter was received from Colonel Upton saying that all differences had been arranged and that a treaty was in progress. The treaty was signed at Purundhur on the 1st March 1776. By it, the English were confirmed in the possession of Salsette and the islands which they actually occupied. The engagements entered into between the Bombay Government and Raghoba were to be annulled, and he was to disband his army and retire to the banks of the Godavery on a pension of three lakhs of Rupees a year. Raghoba, however, declined to accept the pension, and expressed his intention of appealing to the Court of Directors, and of remaining at Bombay until the result should be known. This, the Government of India forbade, and so he retired with a few adherents to Surat.

The Government of Bombay protested against the treaty of Purundhur as being highly injurious to the reputation and interests of the Company. The Council at Poona was moreover irritated at the concessions which had been obtained, and by the countenance still afforded to Raghoba; and their irritation was still further increased when, on the 20th August, a despatch having been received from the Court of Directors conveying their approval of the treaty of Surat, Raghoba was invited to Bombay, and granted a monthly allowance of ten thousand rupees.

To increase the difficulties of the situation, a French adventurer, known as the Chevalier de St. Lubin,\* arrived at Poona in March 1777, and gave out that he was an envoy from the King of France, who was on the point of declaring war against England. He further declared that he was authorised to offer the Mahrattas the aid of 2,500 European troops, an abundant supply of military stores, and officers to discipline 10,000 sepoys. Such was the jealousy entertained of Europeans by Nana Farnavese, that Grant Duff, in his History of the Mahrattas, states, he would never have admitted a French force sufficiently strong to expel the English from Bombay unless he could have seen his way to crushing them afterwards, and that he never believed that St. Lubin could aid the Mahrattas with troops, but nevertheless, for the purpose of annoying the English, he made over to him the harbour of Chaul, only twenty three miles from Bombay.

In July 1777, a despatch was received from the Court of Directors† regretting the sacrifices which had been entailed by the treaty of Purundhur, and stating that although they considered themselves bound in honour to adhere to it, yet, if there was any attempt on the part of the Poona regency to evade its provisions, the Bombay Government was at liberty to renew its alliance with Raghoba. The Council at Bombay found little difficulty in discovering infractions of the treaty, and again prepared to espouse the cause of Raghoba and their movements were hastened by events at Poona.

Dissensions had arisen among the Council of Regency. Moraba Farnavese, the cousin of Nana Farnavese, had been the ostensible prime minister of Madho Rao, and was now dissatisfied because all authority had been usurped by his cousin; and together with other ministers who would not submit to Nana Farnavese, he now entered into correspondence with Raghoba. This confederacy was shortly afterwards joined by Holkar and Succaram Bappoo; and the confederates despatched an envoy to Bombay to request that Raghoba might be conducted to Poona with a military escort. This proposal was readily

\* This man, after many vicissitudes of fortune, entered the service of Hyder Ali about the year 1765. To some of the Europeans serving with him he gave out that he was a Chevalier de St. Louis; whilst to others he represented himself as a Chevalier de Christ. He showed a cross, which he made to serve as the badge of both orders. It is said that it was a real cross of St. Louis, bearing on one side the sword and laurel crown, with the motto, *Bellicæ virtutis præmium*, but the image in enamel of St. Louis had been removed from the other side, and a small cross substituted. Hyder Ali forbade him to wear the cross, but allowed him to have a little extra embroidery on his coat. In 1767 he was permitted to accompany to the coast some English Officers who had been taken prisoners by Hyder, but had been released. Speaking English fluently, and possessing a taking appearance and engaging manners, he soon gained their confidence, and unfolded a plan for inducing the Europeans in Hyder's service to desert to the English. He accompanied them to Madras, and was introduced to Colonel Call, who approving of his plan, introduced him to the governor. He soon acquired great influence over the authorities at Madras, and when, in the following year, field deputies were sent to the army under Colonel Smith, he accompanied them as their adviser. Shortly after the conclusion of the war, he was detected carrying on an intrigue hostile to the English, and was imprisoned. He was released after a short confinement but was expelled from the Company's territory.

† Francis in his journal writes thus on the 28th July 1877,—“Received the Company's letter of February 5th, 1777. Our Poona treaty totally condemned, and in terms which seem expressly levelled at Clavering.”

accepted, and preparations were at once made to carry it into execution. Hastings, who by the deaths of General Clavering and Colonel Monson, had now an ascendancy in the Council, approved of the project, partly because it was countenanced by Succaram Bappoo, one of the signatories of the treaty of Purundhur, but chiefly on account of the countenance which had been afforded to the French by Nana Farnavese, and he determined to support the Bombay Presidency with a detachment of troops from Bengal.

With the aid of Holkar, Moraba Farnavese regained his former ascendancy, and Nana Farnavese thought it prudent to retire to Purundhur. But having succeeded by a bribe of nine lakhs of rupees in detaching Holkar from the cause of his cousin, and being joined by Hurry Punt, commander of the forces, he was speedily restored to power, and before the end of the year 1778 the party of Raghoba at Poona had been completely crushed. The Bombay Government, however, still determined to support his cause. Some of the provisions of the treaty of Purundhur being still unfulfilled, the regency was now asked whether they intended to fulfil the same. Their reply was considered evasive, and a violation of the treaty. A new treaty was now entered into with Raghoba, differing in one point from the former; he was to be regent only, and all acts were to be done in the name of the infant Peishwa, to whom all authority was to be surrendered on the expiration of his minority.

The force organized in Bengal for service in the Western Presidency assembled at Cawnpore, and was composed as follows:—

|                                                                                         | Strength. |
|-----------------------------------------------------------------------------------------|-----------|
| A Company of Golundaz ... ..                                                            | 100       |
| The 1st Regiment of Cavalry* ... ..                                                     | 600       |
| Abdul Rahman's Resallah, known as the<br>Kandahar Horse ... ..                          | 500       |
| Six Battalions of Sepoys, viz:—1st, 2nd, 4th,<br>5th, 6th, and 7th, each 900 strong ... | 5,400     |
| Total fighting men ...                                                                  | 6,600     |

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\* In 1775, it had been arranged with the Nawab of Oudh that his large and ill-disciplined force should be reduced; and the better part formed into six regiments of Cavalry, six of Infantry, and a company of Artillery; to be commanded and disciplined by officers of the Company's service. Only two, however, instead of six regiments of Cavalry were organized. In 1777, this contingent was entirely transferred to the Company, the Nawab defraying the expense of its maintenance, and it was decided that a regiment of Cavalry and two battalions of Infantry should be attached to each of the three brigades into which the Bengal Army was at the time divided. To complete this arrangement, a third regiment of Cavalry was ordered to be raised. The force, however, was kept together in Oudh, and was at first designated the *temporary*, afterwards the *auxiliary*, and finally, the intention of distributing the regiments amongst the three brigades having been abandoned, the *fourth* brigade. The three regiments of Cavalry were placed under the command of Major Hessman, whilst the Infantry were commanded by Lieutenant Colonel Gilbert Ironside. Neither of these officers enjoyed their commands long, for in November of the same year Major Hessman was shot in a duel by Lieutenant Colonel Ironside, who was removed from the command of the Infantry, and Lieutenant Colonel Thomas Goddard was nominated to succeed him. He, however, never assumed the command, having been appointed second-in-command of the force ordered to the West Coast. The first regiment of cavalry commanded by Captain Henry Wray and the company of Artillery were also ordered to join that force.

The total number of European officers was 103.

The Artillery consisted of two 12-pounders, and two howitzers, in addition to the two 6-pounders attached to each battalion.

As great difficulty was anticipated in procuring supplies on the route by which the troops were to march, a complete bazar establishment was attached to each regiment, and to the aid thereby afforded, in the ready supply of provisions, was mainly attributed the successful progress of the force. The number of servants and followers was 19,000, and the bazar establishment numbered 12,000 more, thus bringing up the total of camp followers to 31,000\*.

The Kandahar Horse were in the service of the Nawab of Oudh, and at the suggestion of the Governor General, were ordered to accompany the expedition, as a proof of the interest felt by the Nawab in the welfare of the East India Company. The men were all natives of Kandahar and Kabul, were well mounted, and commanded by a chief of their own clan; and throughout the long and arduous service in which they were engaged, they highly distinguished themselves by their fidelity and valour.

Colonel Mark Leslie † was appointed to command the expedition, with Captain John Cockerell as his Quarter Master General. Leslie was instructed to cross the Jumna to Kalpi, and march thence through Bundelkund to the Nerbudda, on the boundary of Berar, and to make his way thence to Surat. The information possessed at this time relative to the proposed route was very scanty. In 1774, Major Jacob Carnac, who was in command of the troops on the western frontier of Berar, had sent an intelligent native officer, named Gholam Mahomed, to explore the roads and country of the Deccan, and to collect information regarding the Mahrattas. In the following year, Mr. Smith, one of the Company's chaplains, accompanied Colonel Upton from Kalpi to Poona; and during the journey he took observations of latitude and longitude as often as opportunity offered, which was not unfrequently, and with these, together with the intermediate bearings of the road, he constructed a map. Competent surveyors were placed under Captain Cockerell, and the whole of the routes marched by the force during its absence from Bengal were carefully surveyed, and much valuable geographical information was thus obtained.

The march of the detachment was strenuously opposed by Mr. Francis, and also by Mr. Wheeler, who had succeeded to one of the vacant seats in Council, and had only been decided upon by the casting vote of Mr. Hastings. Amongst other objections which were raised was, that the march would be commenced at the hottest time of the year, with the still more inclement season of the periodical rains close at hand. Whilst admitting that the season was unfavourable, the Governor General contended that the pressing necessity for affording

\* Williams' "Historical account of the Bengal Native Infantry"—p. 185.

† This officer had formerly been in the King's service, and had served in America. Of his service in India before being appointed to command this force, little is known. He had the reputation of being a great gambler, and was credited with having won the greater portion of three lakhs of rupees which Mr. Barwell lost at cards.



aid to the Bombay Presidency superseded every consideration of personal convenience.

The force crossed the Jumna at Kalpi on the 12th June 1778; and it was expected that it would reach the Nerbudda before the volume of that river had been increased by the annual rains. The Poona regency had instructed the Mahratta officers in Bundelkund, and had also directed them to induce the chiefs of the country, to oppose Leslie's march. A small body of Mahrattas having intrenched themselves near Kalpi, Major Fullarton, with the 6th and 7th battalions, was ordered to attack them. The order was promptly carried out, and the works captured at the point of the bayonet. Resuming its march, the detachment on the second day after leaving Kalpi, had the misfortune to lose, by a stroke of the sun, one of its best officers, Captain James Crawford, the commandant of the 4th battalion.

The Mahratta chiefs had succeeded in persuading the Raja of Bundelkund to harass Leslie's camp, and intercept his supplies, and shortly after leaving Kalpi, Captain Muuro with a small detachment was cut off by a party of Bundelkund horse. On reaching Chhatarpur, Leslie determined to attack the fort of Mau (Mhow) which was at no great distance. He carried this design into execution on the 10th July; the attack was successful; and the Bundelkund horse for the future kept at a more respectful distance. Being of opinion that the number of guns with his force was not sufficient, Leslie caused a careful inspection to be made of those found in the fort and took on with him such as were found serviceable.

On the 7th July news had been received at Calcutta from Cairo that on the 18th March war had been declared in London against France. Hastings at once commenced to make arrangements for attacking the French settlements in India, and for the protection of those of the British against any enemy or combination of enemies. Amongst other precautionary measures he determined, if possible, to form an alliance with the Raja of Berar. Mr. Elliott was accordingly despatched to Berar on the 20th July with instructions to offer the aid of the British to establish the Raja in the office of Peishwa.

Partly owing to the heavy rains, but chiefly to his having got involved in petty disputes with the chiefs of Bundelkund, Leslie halted at Chhatarpur until the beginning of August, when he resumed his march and arrived at Rajghur on the 7th of that month. Here, again, in spite of urgent appeals from Bombay, he made another long halt. The Governor General annoyed at the slow progress of the detachment, and also with Leslie's unauthorized interference in political affairs, sent an order for Lieutenant Colonel Thomas Goddard\* to supersede him,

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\* He came to India in 1759, with the 84th regiment; on that regiment being ordered home in 1763, he entered the East India Company's service with the rank of Captain. In the following year he raised a battalion of Sepoys at Sarun, which was numbered the 17th. By General Clavering's arrangement it became the 7th, and when single battalion regiments were formed, it became the 13th. It was known, however, to the native soldiery as the *Gaurud*, or *Goddard ka pultun*. It was stationed at Lucknow in 1857 when the mutiny broke out, many of the men remaining faithful, and distinguishing themselves in the defence of the Residency.

but Leslie had died before the order reached Rajghur, and Goddard had already assumed the command. Mr. Elliott having died on the 12th September, whilst on his journey to Nagpore, Goddard, who had been given temporary rank as a Colonel, was intrusted with the charge of the negotiations with the Rajah of Berar, and directed to correspond direct with the Government at Calcutta.

On the 8th October the force set out from Rajghur marching *vid* Saugor and Bhopal. For the first few marches much opposition was encountered from the chiefs of the different States through which it passed. The Sepoys weakened by disease, principally caused by their not being provided with tents to afford them shelter from the rain and dew, and dismayed by the difficulties before them, now began to desert; and on the 1st November Goddard issued an order severely commenting on the spirit of disaffection as evinced by the desertions from the Cavalry and Infantry, but highly praising the steadiness, fidelity, and good conduct of the Artillery. When the force however entered the Bhopal territory, the Nawab, at the risk of incurring the vengeance of the Mahrattas, furnished the troops with supplies and afforded them all the aid in his power. The desertions appear now to have stopped, and on the 1st December, the force forded the Nerbudda at Hoshungabad.

The force from Bengal was so long on its march that the Council at Bombay, dreading lest a French armament should arrive before that place whilst the troops of the Presidency were escorting Raghoba to Poona, determined not to wait any longer, but to conduct him to Poona with such troops as their own Presidency could furnish. They hoped that Raghoba would be firmly seated at Poona and the troops back at Bombay before the French should arrive.

Early in November, a detachment of grenadier sepoy was sent forward under command of Captain Stewart to take possession of the Bhore ghat. This object was effected and the pass fortified. The remainder of the troops embarked at Bombay for Pauwell on the 23rd November and took possession of the fort of Billapore which guarded the entrance of the Pauwell river. Here they were joined by Colonel Egerton who assumed command of the army. The force consisted of 100 European artillerymen, 539 European infantry, 2,689 sepoy, and 200 gun lascars. For the carriage of its ammunition and supplies it was almost entirely dependent upon pack bullocks, 19,000 of which encumbered its movements. On the 25th November the force marched from Pauwell, but so slow were its movements, that it did not reach Campoly, at the foot of the ghats, until the 13th December. Here it was joined by Mr. John Carnac and Mr. Mostyn, who with Colonel Egerton, were to form a committee for the management of the campaign. Continuing to move slowly, it was the 23rd December before the whole army had ascended the ghats.

The slow progress made by the army gave Nana Farnavese and Sindia ample time to collect their forces and to make their arrangements. On the 1st January 1779 the English troops marched from Condal, a village on the Poona side of the pass, and on their march were

harassed by the Mahratta cavalry, and during the course of the day Lieutenant Colonel Kay, an energetic officer, was killed by a rocket. The army continued to advance slowly, constantly harassed by the enemy's cavalry, and on the 4th had the misfortune to lose Captain Stewart, an officer whose bravery was the admiration of the Mahrattas.\* On the 6th, Colonel Egerton, compelled by sickness, resigned command of the army to Lieutenant Colonel Cockburn, but still continued to act as a member of the committee. Cockburn was an officer who had distinguished himself by exploits of the most daring valour and had gained a high reputation,† but the qualities which had fitted him for a secondary appointment proved insufficient for the duties which now devolved on him, hampered as he was by the committee of management.

On the 9th, the army reached Tullygaum, which they found abandoned and destroyed; and it was reported that orders had been given by Nana Farnavese to destroy both Chinchore and Poona. The Mahrattas made a show of resistance but retired as soon as the English line advanced, and the army then encamped within a mile and a half of the enemy whose numbers were estimated at 50,000.

The English army remained in camp at Tullygaum on the 9th and 10th. Confident in the superiority of their disciplined valour they little regarded the demonstrations of the disorganised mass opposed to them. It had been rumoured that a night attack was to be made on the enemy's camp, and this event was looked forward to as being certain of success, and of leading to the dispersion of the enemy, and the consequent fall of Poona. Nor were these hopes unreasonable; for the army was well equipped; there were supplies for eighteen days in camp, and Poona was only eighteen miles distant; and even if the attack had only been partially successful, it was considered that the panic caused thereby would have opened the road to the capital. As yet, however, Raghoba had been joined by no supporters. Carnac became dispirited, and determined to open negotiations with the enemy. Raghoba, who was a gallant soldier, protested against this, urging that no one of consequence would join him until some success had been gained. A panic now seized the members of the committee, and they decided to retreat at once, without even waiting for the result of the negotiations, giving out that the force would only retire as far as might be necessary to preserve its communications with the country below the ghats.

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\* Of this Officer Captain Duff says—“It is a remarkable fact that his name is to this day familiar in the Mahratta country, by the appellation of *Stewart Pharkavy*, which expresses something more than the gallant Stewart, a circumstance that marks the strong impression made by his conduct; and what soldier, wherever he may fall, could desire a nobler epitaph than that such a tradition should be preserved by his enemies.” *History of the Mahrattas*, Vol. II. p. 367.

† Four years before, Brigadier General Gordon in his despatch relative to the capture of Broach and Tannah, recorded his opinion of Lieutenant Colonel Cockburn in the following words,—“Cool, clear, steady and determined as an officer; he has twice within these two years led our troops to assaults, which have been attended with glory and success to him and the troops, and much advantage to our employers. I do not know a better regimental officer.”

On the night of the 11th, "without an effort to achieve the object for which the expedition had been planned, without the slightest excuse which could soften the disgrace, and after having thrown the heavy guns into a tank and burnt the greater portion of the stores and camp equipage, the army commenced its retreat at 10 o'clock."

The force had originally been divided into two brigades, with a reserve of six companies of grenadier sepoys under Captain Hartley. The two brigades were now united, and having sent forward a strong advance guard, the army moved off, the six companies of grenadiers and two guns under Captain Hartley forming the rear guard. It had been imagined that the army could have got away unperceived by the Mahrattas, but three hours after it had started the enemy attacked the rear guard; the sepoys behaved with steadiness and drove back their assailants. After sunrise the main body of the Mahrattas horse and foot again attacked the rear guard, and Hartley being sore pressed sent to Cockburn for aid, but only a small detachment was sent to his assistance. The attack on the rear guard was maintained until four o'clock in the afternoon when it reached Wurgaum distant only five miles from Tullygaum.

Here the army encamped on the night of the 12th. The next day the Mahrattas brought up their artillery and opened a heavy fire on the village; and at the same time a body of their infantry advanced to assault it, but were driven back. During the course of the next day, it was ascertained that the loss of the English on the preceding day amounted to three hundred and sixty two fighting men; of these, fifty six had been killed, and one hundred and fifty one wounded, and one hundred and fifty five were missing; of the latter many were supposed to have deserted to the enemy. Amongst the killed and wounded were fifteen British officers. The committee were now completely overcome by terror and considered that further retreat was impossible, and in spite of the representations of Captain Hartley and other officers, who pointed out the mode in which the retreat might be effected, they determined to negotiate.

Mr. Farmer, Secretary to the committee, was sent to treat with the regency, who, as a preliminary, demanded the surrender of Raghoba, a condition with which, so lost to all sense of shame had they become, the committee would have complied had it been in their power to do so, but Raghoba, seeing the turn affairs were taking, entered into a separate negotiation with Sindia to whom he gave himself up. Finding Nana Farnavese indisposed to enter into terms, Mr. Holmes was sent to treat with Sindia, who being desirous of obtaining ascendancy among the Mahratta chiefs, was greatly flattered by this recognition of his importance; at the same time, however, he determined to take every advantage of the difficulties in which the English had become involved. At length, mainly through Sindia's influence, the regency agreed to permit the army to continue its march unmolested, on the committee promising that Salsette and all the territory recently acquired by the Bombay Government from the Mahrattas should be restored, and that orders should at once be sent to Goddard directing him to return with

his force to Bengal. To these terms the committee agreed ; but at the same time informed the regency, that they had no power to conclude a definitive treaty. A convention on the above basis, known as the treaty of Wurgaum, was, however, duly signed, and the English were still further humiliated by having to give two hostages, Mr. Farmer and Lieutenant C. S. Stewart, for its due performance. The army then resumed its march and descended the ghats unmolested, and the first act of the committee on finding themselves at a safe distance from the enemy was to send an express to Goddard to cancel the order directing him to return to Bengal.

As the committee had informed the Poona regency that they had not the power to conclude a definitive treaty, Mr. Hornby, the governor of Bombay, determined at all hazards to repudiate the convention of Wurgaum. On the return of the army to Bombay, Colonel Egerton and Lieutenant-Colonel Cockburn were suspended, and subsequently, together with Mr. Carnac, they were dismissed from the Company's service. The gallant behaviour of Captain Hartley was universally acknowledged, and the governor promoted him to the rank of Lieutenant Colonel.\* Such promotion being unprecedented in the Company's service, the officers who had previously been senior to him, represented the injury caused to them by this measure, and some time afterwards the Court of Directors ruled that Hartley was to keep his rank, but was to remain junior of that grade, and his pay as a Lieutenant-Colonel stopped, until all who had been his seniors should have been promoted in the usual routine.

Colonel Goddard was in the meanwhile halted at Hoshungabad, carrying out the negotiations with Mahadaji Bhonsla ; that chief would in all probability have agreed to the Governor General's plans had they been made to him earlier, but, before they had been unfolded, he had heard of the arrangements made at Bombay to support Raghoba, and of the preparations at Poona to oppose the same. He concluded therefore that any pretensions he might advance to the office of Peishwa would be vigorously opposed and so he wisely determined to decline the Governor General's proposal. He, however, used every exertion to produce a friendly feeling between the regency at Poona and the Government at Calcutta, and effected the dismissal of some French officers from the former city.

Immediately on receiving the Raja's final answer, Goddard determined to continue his march to the coast, but although he had punctually transmitted intelligence of his movements to the authorities at Bombay, he had received no communication from that quarter, and was consequently ignorant of the plan that had been formed for escorting Raghoba to Poona. The Raja, however, on hearing that a force was about to march from Bombay, communicated the intelligence to Goddard, who was somewhat perplexed as to the course he should pursue ; finally he decided to march for Poona, and the Raja having liberally

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\* He was a Cadet of 1763. The Governor of Bombay promoted him to Lieutenant-Colonel from the 11th April 1779.

supplied him with provisions and cashed his bills, he was able to march from Hoshungabad on the 16th January 1779.

On the 22nd he reached Charwah ; here he heard that the Bombay troops had occupied the Bhore ghat. On the 24th he received a letter from the field committee dated the 11th of the month, stating that in consequence of an alteration in the state of affairs it was not expedient that he should advance towards Poona, but that if he considered he could do so in face of the large body of Mahratta horse by whom his march would be impeded, he should make his way to Surat. If, however, he deemed this impracticable, he should remain in the territory of the Berar Raja until further orders. This letter placed him in a state of uncertainty as to whether the Bombay army had met with a reverse, or were so confident of success as not to require his aid.

The next day came a letter from the council at Bombay urging him to advance, but as this letter was written apparently without the knowledge of the circumstances which dictated the letter of the field committee, Goddard made up his mind to proceed to Burhanpur in hopes of obtaining some trustworthy information at that place. He arrived at Burhanpore on the 30th and encamped about a mile from the city. So careful was he to conciliate the good will of the inhabitants that he would not suffer an officer or man of his force to enter the city. The effects of the strict discipline he preserved, combined with his system of promptly paying for all supplies, had an excellent effect, provisions of all kinds were, therefore, brought to his camp in abundance.

On the 5th of February he heard of the disaster at Wurgaum ; and at once decided to march as rapidly as possible to Surat. He marched the following day ; and on the 9th, was met by a vakeel from Poona, with the letter from the committee desiring him to return to Bengal ; to this he replied that he was acting under the orders of the Supreme Government. Continuing his march he reached Surat on the 25th February, having accomplished a distance of a little over 220 miles in nineteen days, his route lying through a country of which no map existed, and baffling by his skilful arrangements, a force of 20,000 cavalry which had been sent from Poona to intercept him. The reputation of the force for discipline and punctual payment for supplies had preceded it, and during the whole march provisions of all sorts were freely brought to his camp. Immediately after his arrival at Surat, Goddard embarked for Bombay to confer with Mr. Hornby the Governor.

On the conclusion of the negotiations with Mahadaji Bhonsla, the Governor General had appointed Colonel Goddard envoy to the Court of Poona, with instructions to conclude a treaty with Nana Furnavese, on the basis of that of Purundhur, with an additional stipulation for the exclusion of French officers from the Mahratta States.

On news of the convention of Wurgaum reaching Calcutta,\* Goddard was promoted to the rank of Brigadier General, and a recommendation was sent to the Court of Directors urging that he should be appointed Commander-in-chief at Bombay. The Bombay government protested against the rank bestowed upon Goddard,† which made him senior to every officer in that presidency, and also against his being permitted to negotiate with Poona except through their act. They also protested against his commanding a military force in their presidency, independently of their authority. Having recorded these protests Mr. Hornby and his Council loyally set to work to forward the views of the Supreme Government.

The result of Goddard's visit to Bombay was that Mr. Hornby, in view to obtaining resources and weakening the enemy, forwarded on the 30th March a proposal to the Governor General for a treaty with the Gaekwar family. He suggested measures for reconciling the brothers Futteh Sing and Govind Rao, for releasing them from all dependence upon Poona, and for conquering for the Company that portion of Gujerat which appertained to the Peishwa. In the same communication he gave reason for believing that Sindia was anxious to enter into an alliance with the English. Mr. Hornby's communications were carefully considered by Mr. Hastings, who decided that the British authority should not be used for reconciling the differences between Futteh Singh and Govind Rao; but that an alliance was to be formed with Futteh Singh, the acknowledged head of the Baroda State. Mr. Hastings agreed with Mr. Hornby in thinking that Sindia was desirous of forming an alliance with the English, and General Goddard was instructed to treat separately with Sindia, if he found him willing to espouse the cause of the Company.

Roghoba, since his separation from the English at Wurgaum, had remained under charge of Sindia, who, while fully alive to the political advantage of retaining charge of his person, treated him with great respect. He bestowed upon him a jagheer of twelve lakhs of rupees in Bundelkund; and permitted him to retain his artillery and most of the troops he had brought from Bombay; and placing him under the care of his dewan, sent him with an escort of four thousand horse to the jagheer which had been assigned to him. As they were preparing to cross the Nerbudda, Raghoba attempted to escape; a fight ensued between his troops and Sindia's horsemen, in which the latter were routed, and the dewan mortally wounded. Raghoba at once set out

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\* Hastings writing to Laurence Sullivan says:—"On the 25th of February, we received the first news of the defeat of the army at Tullygaum. It was not till the 18th of March that we received the confirmation of it from Bombay, in a very short letter, which said scarce more than that the army had been defeated, and was returned, and that a treaty had been made, which they would disavow. We have heard from them no more since, but letters arrived yesterday, 27th April, from Poona, conveying a copy of the treaty, which made me almost sink with shame while I read it." Gleig's *Life of Warren Hastings*, Vol. II p. 272.

† Goddard's monthly Pay and Allowances amounted to Rs. 12,050 and was made up as follows: Pay Rs. 300; allowance for Table Rs. 5,000; Batta Rs. 1,500; contingencies Rs. 5,000; Horse allowance Rs. 250.

for Broach, and reached Goddard's camp on the 13th June 1779, where he was honourably received, and an allowance of half a lakh of rupees a month settled on him.

The regency at Poona, affecting to consider the convention of Wurgaum a final settlement of their differences with the English, had invited them to join in an attack on Hyder Ali, who, taking advantage of the general confusion of the times, had overrun the Mahratta territory up to the Kistna. The reception accorded to Raghoba, however, convinced them that the convention was not considered binding by the English, and they now entered into a confederacy with Hyder Ali and the Nizam, and proposed that the English should be simultaneously attacked in all three presidencies.

Goddard obtained early intelligence of the negotiations which resulted in this confederacy, and kept Hastings fully informed of all matters connected therewith. About this time a correspondence was intercepted between the Vakeel of Nana Farnavese and the chief of the Dutch factory at Surat, from which it appeared that the latter had joined in a plot to assist the Mahrattas to surprise the castle of Surat. Futteh Sing, the chief of Baroda, was also manifesting a disposition to procrastinate. Hastings, on receiving intelligence of the confederacy with Hyder Ali and the Nizam, desired Goddard to demand that a definite answer should be given within twenty-four hours to the English proposals. In reply, the Vakeel stated that the restoration of Salsette and the surrender of Raghoba were necessary preliminaries to any treaty. Upon receiving this answer, the Vakeel was desired to quit the camp, and preparations were made for the immediate renewal of the war.

Having been reinforced from Bombay by a detachment under the command of Lieutenant Colonel Hartley, consisting of 100 European Artillerymen, 200 European Infantry, and two battalions of native Infantry, one of them being grenadiers, and the other composed of volunteers, chiefly men who had served under Hartley during the retreat from Tullygaum, Goddard marched from Surat on the 1st January 1780, and proceeded to reduce the fort of Dubhoi, which was garrisoned by 2,000 of the Peishwa troops. It was summoned on the 18th, and evacuated by the garrison on the night of the 19th. Brodera and Pitlad also speedily fell into Goddard's hands. Futteh Sing now began to negotiate in earnest, and a treaty offensive and defensive was soon concluded, by which it was agreed that he should join the English with 3,000 horse, and receive possession of the Peishwa's territories north of the Myhie, and that certain districts to the south of the river should be made over to the Company. Goddard then marched against Ahmedabad, the capital of the province; it was surrounded by walls of immense extent, and computed to contain 100,000 inhabitants. He arrived before the place on the 10th February, opened his batteries on the 12th, and carried it by storm on the morning of the 15th, with a loss of 106 killed and wounded. The officers killed were Major Spith, Bombay Engineers, Captain Thomas Gough, commanding the 5th Bengal battalion, and Mr. Wright a volunteer.



The escape of Raghoba had caused a coolness between Sindia and Nana Farnavese, but they were now reconciled, and united to oppose Goddard. Sindia and Holkar at the head of 20,000 horse crossed the Nerbudda on the 29th February, and encamped near Baroda. Goddard determined to meet them without delay. Sending back his heavy guns and stores to Surat, he marched from Ahmedabad on the 2nd March, and arrived within two miles of Baroda on the 8th. Sindia and Holkar, on hearing of the advance of Goddard retired to Pawangurh, and thence Sindia sent vakeels to Goddard, expressing his friendship for the English and his readiness to conclude a treaty of peace; and on the 9th, Mr. Farmer and Lieutenant Stewart, who had been given as hostages to the Mahrattas at Wurgaum, and whom Sindia had treated with great consideration, were restored to liberty, and sent to the British camp.

It soon became evident that Sindia's chief object was to gain time. Goddard therefore desired the vakeels to return with an intimation that the negotiations must be brought to a close within three days. Sindia's replies not being considered satisfactory, Goddard, who was encamped at Comboale, determined to make a night attack upon the Mahratta camp, distant about six miles. He remained quiet in his camp until the 2nd April when he decided to attack the enemy that night. The force told off for this purpose consisted of ten grenadier companies of sepoys, headed by the two grenadier companies of the Bombay European regiment; two battalions of Bengal, and one of Bombay, native Infantry; the Bengal Cavalry and the Kandahar horse; with twelve pieces of Artillery. Lieutenant Colonel A. M. Baillie, Bengal Artillery, commanded the first line, Major Hopkins the second. It was 2 A. M. before the force had fairly started. The enemy's out-posts were surprised, but day dawned before their camp was reached, and the Mahrattas quickly mounting their horses drew up in order of battle; they even made a movement as if to charge, but being met with a brisk fire, they galloped off and were soon out of sight; but during the day it was ascertained that their entire army had taken up another position a little further off.

On the 14th April, Goddard was joined by a detachment from Madras, under command of Lieutenant Colonel Browne, consisting of 100 Madras European Artillerymen; the 1st battalion Madras European Infantry 500 strong; and a battalion of Madras native Infantry. On the 9th he again advanced to attack the Mahrattas, but on his approaching near they discharged a flight of rockets and rode off. They were pursued by the Kandahar Horse who succeeded in cutting up a few of them. Goddard continued to keep close to Sindia, whom he in vain tried to bring to action, until the beginning of the rains, when he placed his army in cantonments.

It was during this campaign that the dashing affair occurred which is described in a Minute of the Bengal Council dated 24th August 1780, and which was published to the Bengal army. The following is an

extract:—"Lieutenant Welsh\* having been detached with the Regiment of Cavalry, the Kandahar Horse, and the 7th Battalion of sepoys against Gunness Punt, a Maharatta officer, who with a body of 4,000 horse and 300 foot, with 3 field pieces, had been infesting the environs of Surat, performed this service with so great a success, and, what redounds to the credit of his gallantry and conduct, only with the Cavalry and Kandahar Horse; for thinking that his purpose might be frustrated if he did not push forward on the morning of the attack with all possible expedition to reach the camp of the enemy before day break, he left the Infantry at a distance. He put the enemy to quick flight, possessed himself of their whole camp, their guns, their tents and their baggage, and Gunness Punt died soon after of the wounds he received."

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\* Lieutenant Thomas Welsh was appointed a cornet on the Bengal Establishment, 12th September 1769; Lieutenant, 2nd February 1773; Captain, 18th January 1781; Major, 1st March 1794; Lieutenant Colonel, 1st January 1798; Colonel, 29th May 1800; and in the August following was placed on the retired list. In 1806, Colonel Welsh was a candidate for a seat in the East India direction. He died 11th April 1822.

[*To be continued.*]



## V. THE MILITARY CANTONMENTS OF INDIA.

BY  
CAPTAIN MARTIN MARTIN, R. E.

Among soldiers of all ranks there is, perhaps, no more frequent subject of conversation than the merits or demerits of this or that Military Station.

Probably the divergence of opinion will be particularly noticeable as to each Station brought under review, and the only conclusion that can be arrived at by a stranger will be, that all Cantonments in India are subject to very many disadvantages.

In the older Cantonments of India, selected after a somewhat haphazard fashion, dictated frequently by frontier limits which no longer exist, or by lines of road which have ceased to be communications by rail, it is of course impossible to do more than mitigate existing evils.

It is, however, in the selection of fresh stations that most can be effected, and as the consolidation of the empire advances and our geographical knowledge of it increases, it becomes plainer that fresh distributions of our military forces are required, from day to day, both from strategical, tactical and sanitary reasons.

Roughly speaking, military stations in India are divided into Hill and Plains Stations. Although we know better in India, Hill stations are regarded at home as earthly paradises combining the climate and scenery of the Alps with all that is wealthy, profuse and luxurious in the "Gorgeous East." The many inconveniences and disadvantages of these stations are, however, too well known to need mention, and it is probable that if all ranks were polled, the result of a military plebiscite would be in favour of the large and moderately cool stations in the plains, both the small cramped hill stations and the most fiery of the various furnaces being excluded. Probably the most popular of the Stations in the three Presidencies are Lucknow and Meerut in Bengal, Secunderabad and Bangalore in Madras, and Poona in Bombay.

It will probably be contested that popularity *per se*, is no criterion of the value of a Military Station, that these are selected for reasons of State, and that the soldier has merely to obey orders and go where he is told. He always does so, however, and in reply it may be said that the health and contentment of British soldiers in India, which together go far to make up "condition", must ever be an anxious question to Military Administrators, and that the third component of condition, to wit, Military training, is precisely the one for which greater facilities exist in the larger and more popular stations of the plains, the emulations and rivalry between regiments constituting an important item in the zest with which military excellence and proficiency in sports and games is pursued.

It was on the Eton playing fields that the Duke of Wellington declared the battle of Waterloo was won, but he would hardly have extended his observation to the contracted area and limited competition of the play-ground of a private Academy. Let any one contrast Meerut and Sabathu and the illustration will perhaps appear appropriate.

Possibly more argument than is necessary has been employed to winnow out the first desideratum of a Military Station, viz., that it

Military Station should be large. should contain as large a force as possible, and preferentially of all arms. A considerable saving to Government is effected over the smaller stations:—

1. In the Camps of Exercise.
2. In the service of the Departments.
3. In the facilities afforded for instruction and training.
4. In the increased knowledge of the actual and relative capacities of officers, regiments and individuals.

It may, perhaps, be advisable here to enquire whether the advantages of the large Military Stations and training schools cannot be combined with the advantages of a hill climate and the economy in native establishments, invaliding charges, losses by death, disease and unserviceable condition, in all of which the hill stations present advantages that no Government can afford to neglect. It is only possible to

Neither on plain or peak. combine the two advantages when a large garrison can be quartered on an elevated plateau, sufficiently lofty to secure the desired climate, sufficiently extended and well watered to permit of occupation, and suitably posted strategically, in good communication with possible areas of activity or disturbance.

Of all our Military stations Quetta most nearly fulfils the specified conditions, and if the healthiness, accessibility and conveniences of this station leave still a good deal to be desired, the disadvantages are, to a large extent, in course of removal. Another site possessing some possibilities as a station for a large force of British is Abbottabad.

There are many others beyond our present territorial limits which must occur to many—among them being many sites in Kashmir, the plateaus of Tirah near the Khyber pass, of Shum in Waziristan, and some of the more favoured districts of Afghanistan, such as the slopes of the Sufed Koh, both on the Shalozan side and towards Sufed Sing, the grass downs around the Sher-i-dahin pass near Ghuzni, &c.

Even should our occupation of one or more of these points be distant, it still may not be entirely profitless to consider the best form of cantonment designable in the most favourable locality available, which, if the preceding argument is tenable, is capable of description as a "hill plateau"; mountain and plain being alike condemned when their combined advantages can be obtained and their defects excluded by the type selected.

And this brings us forward from the selection of locality to the laying out of the station advantageously to the interests concerned.

Perhaps the design of a typical Indian Military Station is worse than the usual site selected. In the newly published life of Sir John (Lord) Lawrence, we are treated to a description of the old selection of the site for the Mian Mir Cantonment by Sir Charles Napier, the indecisive gallop and the hasty resolution, the sword planted in the Sikh graveyard, the well meant and partially carried out improvements of those who had to give effect to designs they disapproved, and the result can be considered now at leisure. A Church, the finest building of its kind in the Punjab, occupies a site unequalled in its drear misery and overlooks a variety of scattered buildings descending, in appearance and comfort, from the lofty, clean and airy hospitals and barracks of the British soldier, to the dirty mud bungalows of the officers, the whole chequered with wretched avenues of trees struggling vainly with a lime substratum and interspersed with sand wastes broken here and there by a few melancholy tamarisk trees and enlivened with the strains of the Persian wheel.

Such a station has none of the elements of permanence. A necessary condition for the fit care of the troops and a proper interest in the improvement and development of a station, is suitable accommodation and conveniences for officers. High rents and mud hovels hardly fulfil this basis, and all through the Punjab the same phenomena may be observed.

There is a tradition that the Hon'ble East India Company, on annexing, very unwillingly, the Punjab, issued an order that permanent buildings were not to be constructed in a province whose occupation might not be permanently desirable, and that the unholy aspect of the military cantonments in this favoured and sunny land is the result of the original doubts of the Directors as to the value of their most recent acquisition.

In turning to the other type of Military Cantonment, viz., the hill station or sanitarium, we do not again find any great skill in the disposition of the buildings, roads, &c. Only too just an appreciation of the disadvantages of the rugged, waterless (though rain washed) peaks, crests and ridges, seems to have attended the birth and infancy of the ricketty settlement. "Build huts to last 3 years" is the first order—"occupy them while they hold together" is sometimes the second. In the meantime roads up hill and down hill have of necessity been made, and when at last a more permanent class of building springs up on the ruins of the hut camp, the mischief of the original want of design has crystalised into a permanent muddle past repair.

The above process is the exact contrary to that employed in founding a settlement in our Colonies or in America.

The first hut occupies a regulated position in the future city, the skeleton of which is laid out often enough on a scale which never assumes the full reality. The method is, however, preferable to the Indian one.

It is, perhaps, easier to find fault than to suggest remedies, and easiest of all to criticise the suggested remedies. The enclosed sketches,

however, show what are undoubtedly *some* of the faults of Indian Stations, and an imaginary new cantonment, designed by Sir Romulus Haussmann is also sketched.

The chief faults in Indian Stations, as it appears to the writer, is the want of scheme, that is, the best sites are not at once occupied by public buildings and institutions. It is not uncommon in Indian Stations to have two or three theatres—none good—several cricket grounds—all unkept, swimming baths that do not hold water, &c. The theatre, ball rooms, concert rooms, baths, racket courts, clubs, &c. &c., might easily, in a new station, be centralised in a thoroughly good Kursaal, or *Etablissement*, overlooking the central open space, lungs or “place” which in Haussmanabad is designed to serve for ventilation, show parades, polo, cricket, races, &c., the whole being easily viewed from the Kursaal. It is supposed that out-posts, skirmishing, musketry, &c., might much more easily be practised on the rough ground outside the cantonment and nearer the barracks; consequently show or Grand parade is used in designating a portion of the Race course. This space would have a side of from  $\frac{1}{2}$  a mile upwards so as to give a course, say  $1\frac{1}{2}$  miles.

Taking the ordinary figure of the union jack, Haussmanabad is planted closely as a thicket in the blue spaces, while the red ones are left as open glades. This enables every compound to have some lawn and some plantation and to conceal its houses in the thicket. This form of ventilation also enables the trees and shrubs to be allowed to grow thickly and the roads to be closely planted by trees meeting over head, as they (the roads) are no longer needed for ventilation. In crossing the glades there will be no shade overhead but the roads will be far more interesting than a continuous avenue, as thick shade will alternate with airiness and constantly changing views. There will be no spare or waste space in Haussmanabad, such as disfigures the over wide Indian road, and ventilation will be furthered in the glades (which are say 200 yards wide) by only allowing open fences of iron hurdles or timber in these portions of the roads. In the parts where the roads pass through the thicket, any form of hedge would be permissible, any height or thickness.

Mud walls would of course be forbidden. The enormous incubus of numberless servants, each entertaining grand mothers and grand children alike, might be relieved by the employment of Chinese. Chinese servants have made Singapore a model for any Indian Station. They give less trouble, are disposed to be cleanly, and leave their grand-mothers at home, besides uniting several of the functions performed individually by Hindustani trade-unionists or caste fellows. As *gardeners* the Chinese are incomparably superior to the so called *mali*, while conservancy is a fine art in the Celestial Empire, and washing is well understood—Chinese do not shout to each other and are not musical.

The present paper has only touched lightly on domestic architecture. The illustrations, however, show the ordinary arrangement of a bungalow in Pindi, Jhelum or Peshawur.

Roads on all sides, bath rooms at the four corners, no front, no back servants quarters backing the public roads, and scanty hedges trimming (in a fashion !) the approaches, and where not in gaps shutting out the gardens from view of the occupants.

Sketches VI. and VIA show how it is thought the design might be improved.

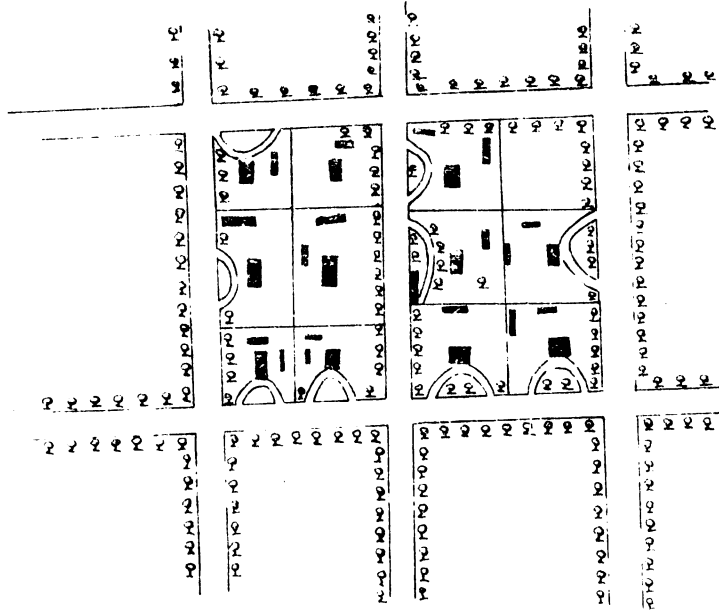
And here the limits of an essay for this Journal as defined by the Viceroy have been reached. It is to be hoped that there is a certain amount of suggestiveness beyond mere fault-finding to be found in the foregoing lines, but to lay down details for the organisation of perfection, which must vary according to taste, is as far beyond the limits of an essay, as it is beyond the capabilities of the writer.

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FIG: I.



*Part Plan of ordinary Station.  
Shewing arrangement of trees, roads,  
out-houses and houses.*

FIG: II.

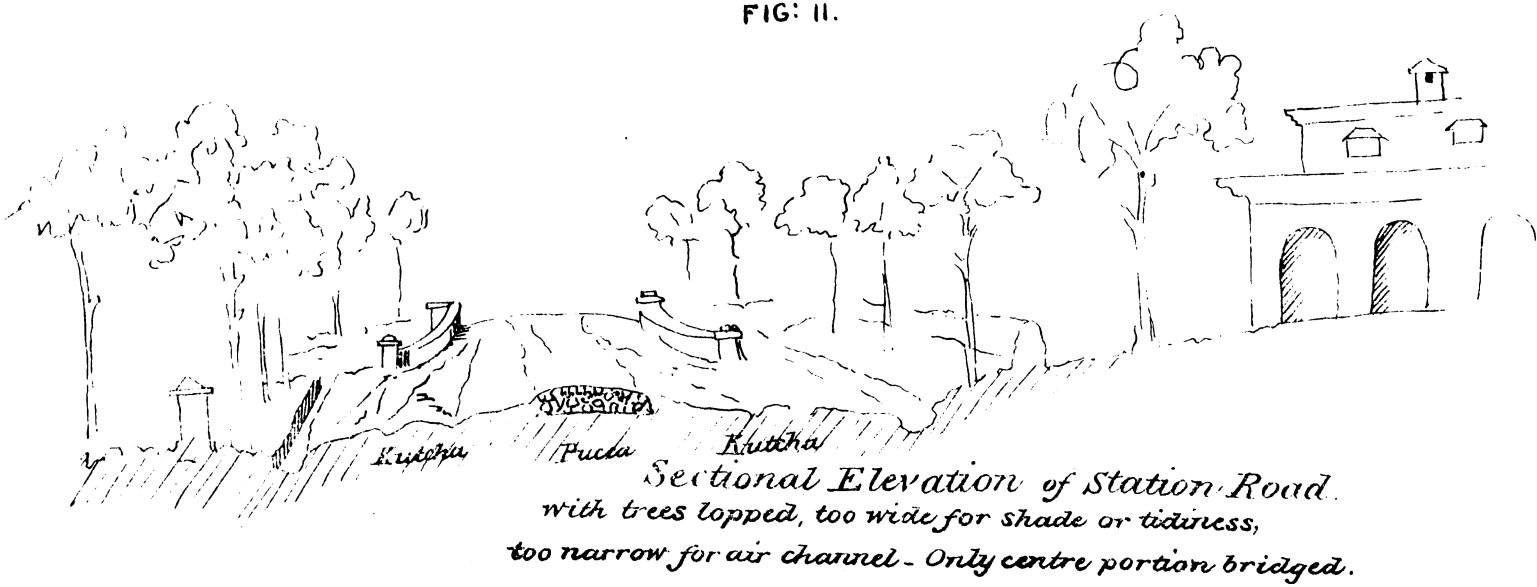


FIG: III.

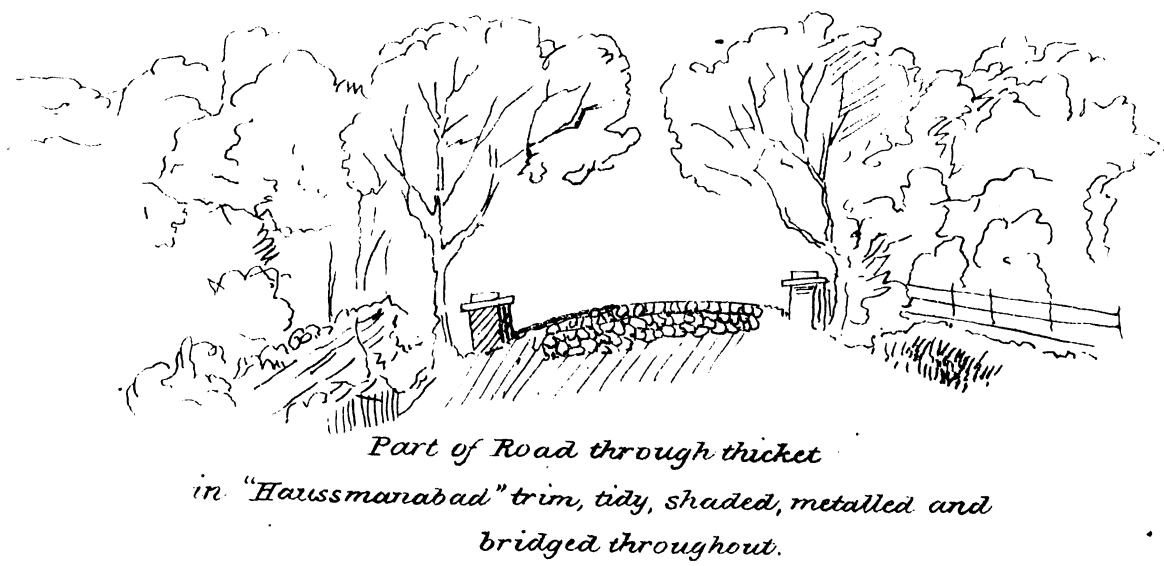
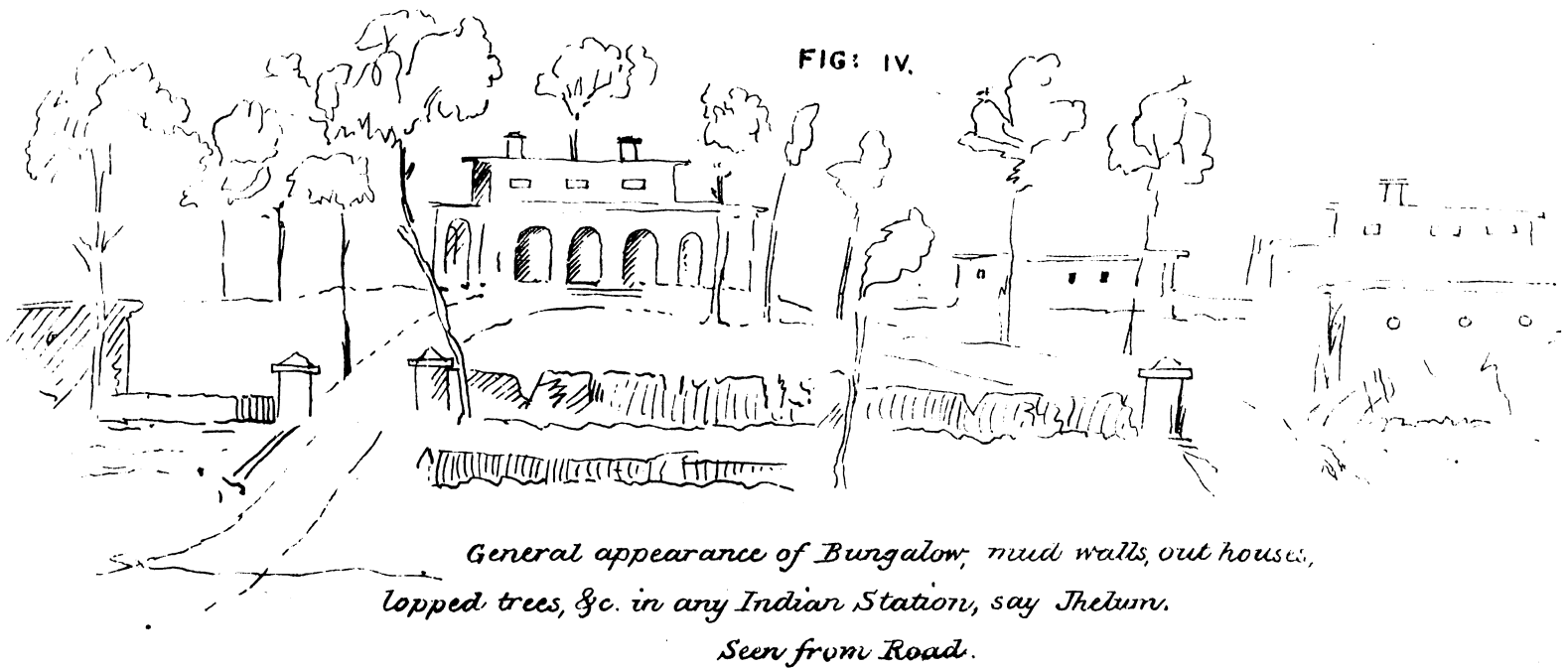


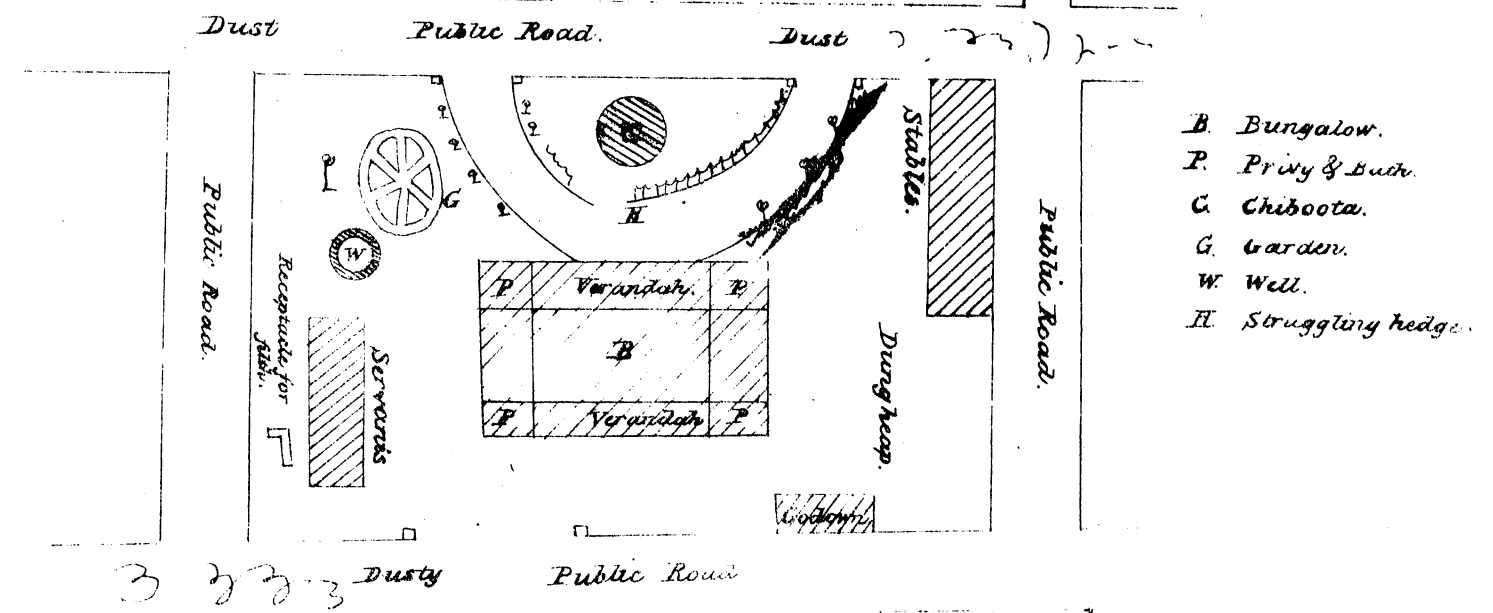
FIG: IV.





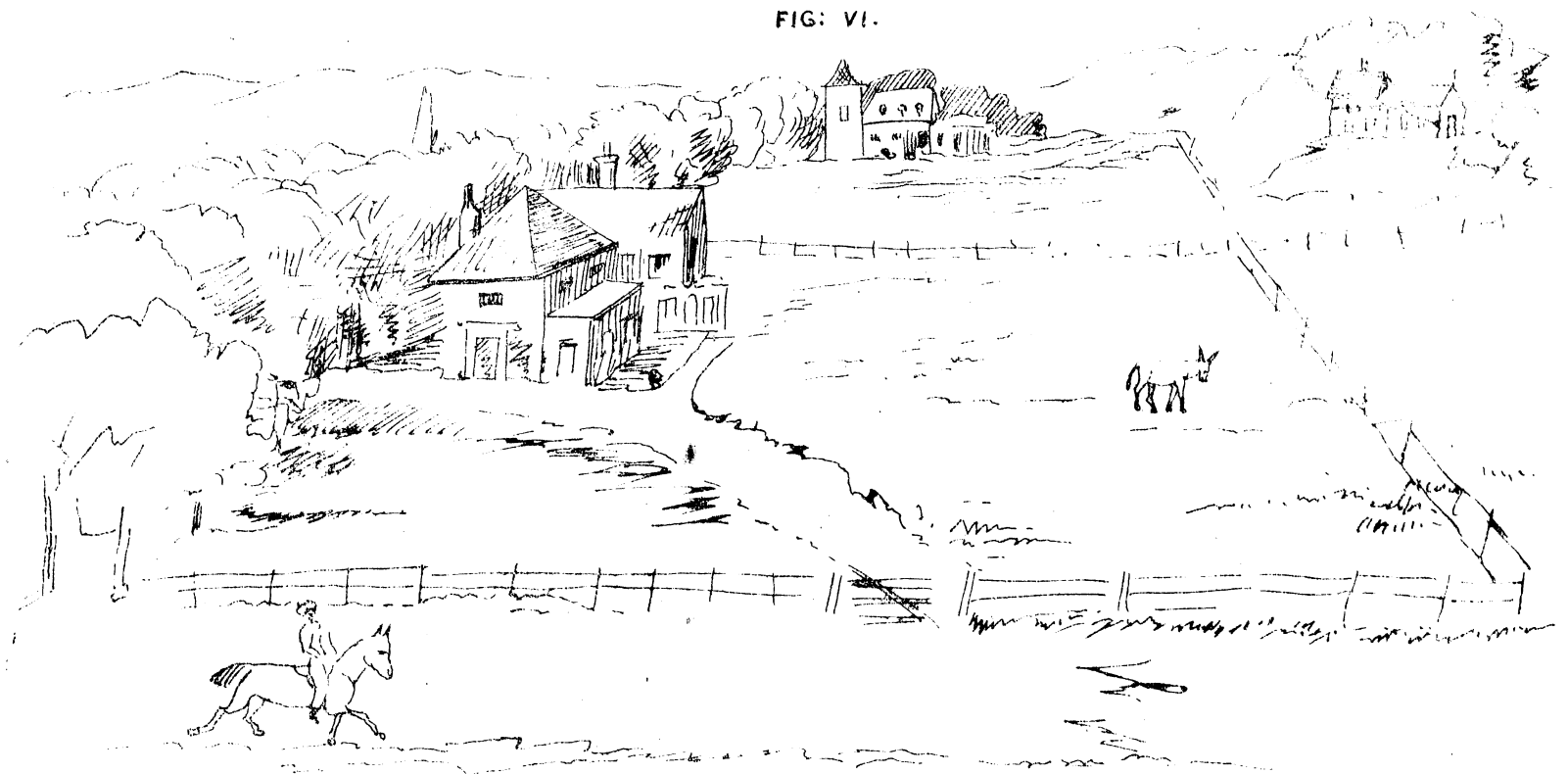
Plan of Bungalow.

FIG: IV A.



View looking up ventilating glade  
 in "Haussmanabad".

FIG: VI.



Showing road, houses placed in glade, backed and shaded by thicket - Only  
 open fences in the glade. All out houses concealed in thicket.

Plan of Compound "Haussmanabad".

FIG: VI A.

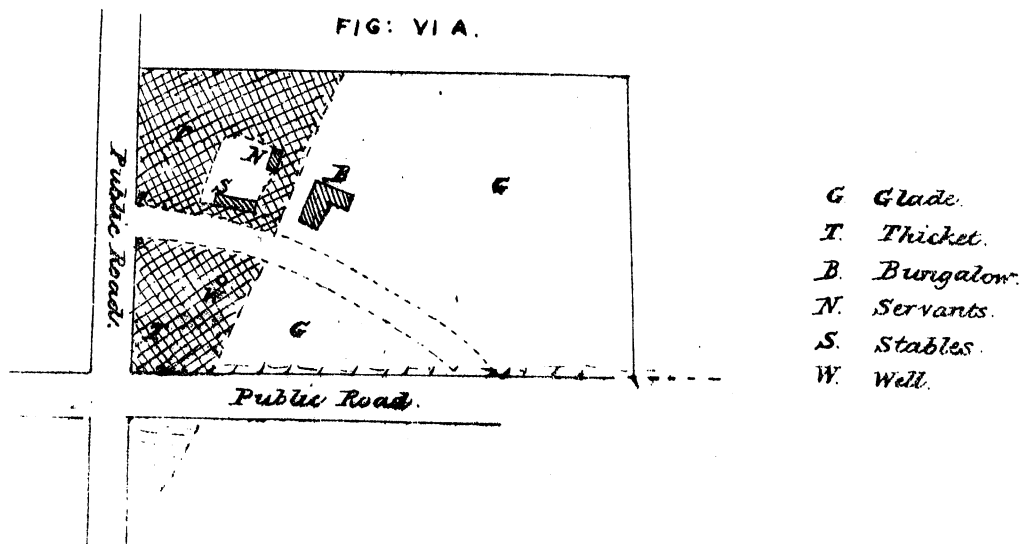
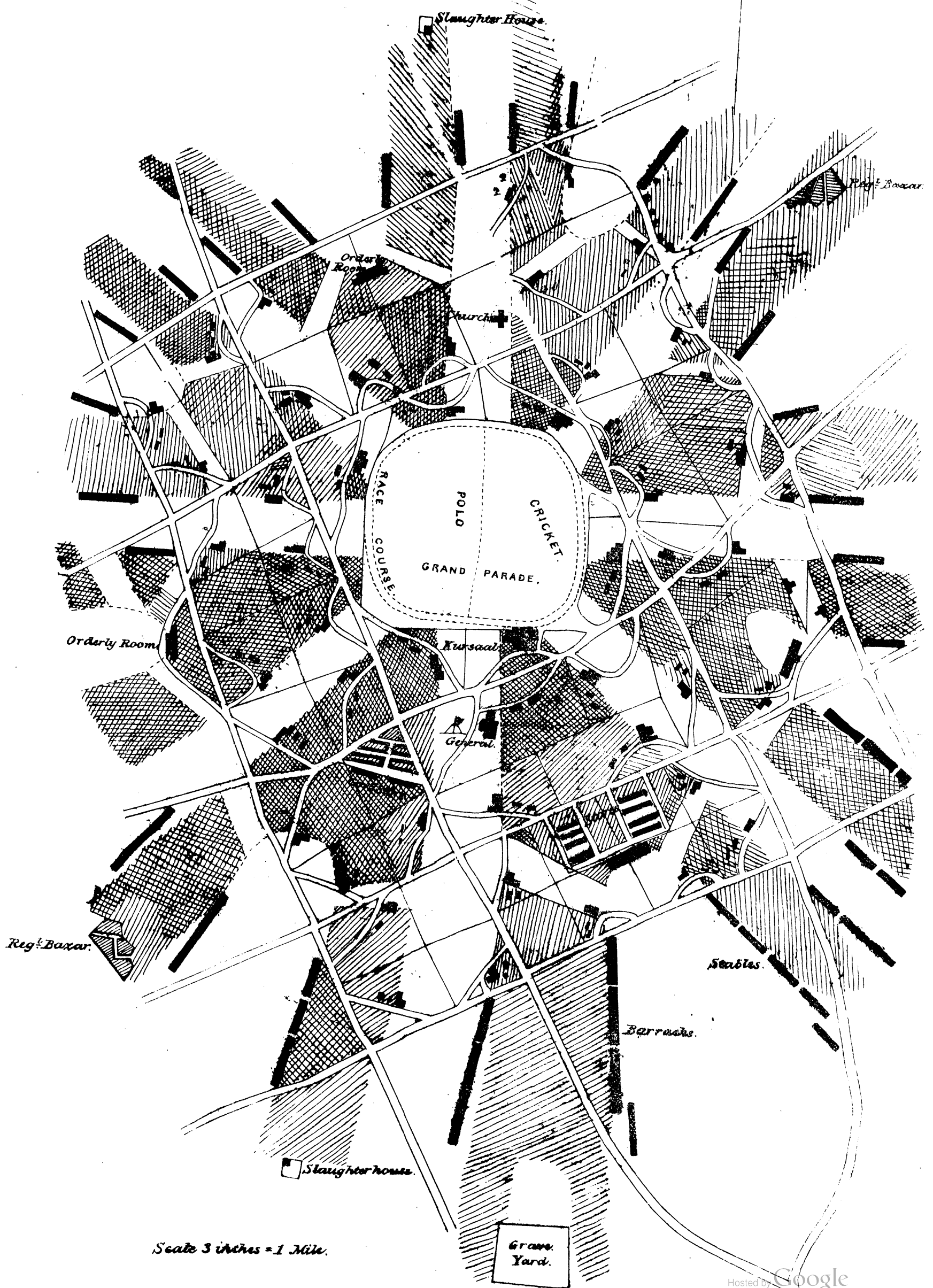




FIG: V.  
**HAUSSMANABAD.**





# VI.

## SOME REFLECTIONS ON MACHINE GUNS AND THEIR TACTICS,

BY  
MAJOR GASELEE A.Q.M.G.  
AND  
CAPTAIN C. HOSKYNs, R.E.

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Mr. Nordenfelt, inventor of the Nordenfelt Machine Gun, said in a lecture given at the Royal United Service Institute, on June 28th, 1880 :—

“I look upon Machine Guns as mechanical contrivances for economising human labor and human life in war.—They are to the art of war what Arkwright’s spinning jenny was to weaving.”

“He enabled a few people to produce as much yarn in an hour as scores, employing the turn, with its single spindle, could make in a day, and even the turn was a great advance on the distaff.”

“The Machine Guns have for special purposes the same superiority over the breech loader, the old Enfield rifle and Brown Bess.”

2. Though many will not be able to accept the above statement as proved, yet the most conservative soldier must admit that the Machine Gun will eventually be introduced into the army, and it is certain that much discussion and argument will ensue before it is finally decided, what are legitimate Machine Gun Tactics.

3. At present there is much diversity of opinion on this subject, in which class prejudices form an important factor, and I hope that the reader will find the ensuing discussion on Machine Gun Tactics between Mr. Nordenfelt and Major Gaselee instructive and suggestive.

4. Mr. Nordenfelt in his paper advocates the use of Machine Guns with all arms.

Major Gaselee deprecates these guns being attached to Cavalry and Artillery and these opinions will most probably be upheld by most military readers.

5. The questions which will have to be decided before the Machine Gun is generally introduced are :—

1.—Are they to be attached to different Arms as adjuncts ? or,

2.—Are Machine Gun batteries to be introduced (as a distinct service) which can work tactically with any arm of the service at the will of the General ?

6. Let us discuss system No. 1 in which Machine Guns are attached to the different arms as adjuncts. This system may recommend itself at first sight on account of its apparent cheapness.



In the case of Infantry, the Commanding Officer would have a certain number of Machine Guns which will be an integral part of his regiment. He will have to appoint an officer in command of Machine Guns, and also select squads who will have to be drilled as machinists, and be perfectly intimate with the weapon.

7. There are three ways in which Machine Guns can be carried if attached to Infantry.

- 1.—On men's shoulders.
- 2.—On a travelling carriage.
- 3.—On mules.

The 1st and 2nd methods would both have their drawbacks.

The 1st system would be most distasteful to the soldier, and it is more than probable that carriers would have to be especially enlisted for this duty, who would be unarmed and require a guard. In addition to gun carriers, there would be ammunition carriers. Occasions might often happen in which these guns would hamper the mobility of the regiment.

The 2nd system (travelling carriage) in which both gun and ammunition would be similarly transported on wheels, would in some respects be simpler than that of carrying on shoulders.

Two men could drag the gun with greater ease than carry it. On the other hand the carriage would not be so mobile and in many cases would have to be bodily carried.

System No. 3 (carrying on mules) is familiar to us all in the Mountain Battery. It is the best and most mobile system; but it entails an equipment somewhat similar to a Mountain Battery. It would not be self-sustaining in as much as the mules, &c., require an infantry guard, and it would also involve changes in battalion drill, for, unless the Machine Guns always worked with the Regiment, their drill or mobility would be defective.

8. With Artillery the Machine Gun would necessarily have to be mounted on a carriage and be horsed. The battery would require extra men, horses, machinists, for the equipment of the guns. They would be as mobile as artillery, and would be used to protect the flanks of the battery.

9.—Machine Guns attached to Cavalry would be mounted on wheels, and horsed.—Their mobility would not equal that of Cavalry and would hamper the regiment in many ways.

10.—From the above premises it appears, that the Machine Gun, if attached to the different 3 arms, is—

- 1.—Equal in mobility to Artillery.
- 2.—Inferior in mobility to Cavalry.

3.—Probably inferior in mobility to Infantry, putting aside the case where it is equipped as a mountain battery, and therefore we can logically deduct the following conclusion.

That the system of attaching Machine Guns to the different arms would be detrimental to the mobility of Cavalry and Infantry, but not to Artillery, and that therefore Machine Gun batteries when introduced will have to be a distinct service and of two kinds :—

## 1.—Field Battery.—

To act with Artillery.

## Mountain Battery.—

To act with Infantry.

Of course many readers will demur at the conclusions arrived at. The subject is, however, one of growing importance and in the humble opinion of the writers well worth ventilating.

The preceding remarks and deductions have entirely borne on tactics in the field, where there is doubtless considerable difficulty in defining the legitimate position of the Machine Gun with reference to the 3 arms, but all readers will agree, that for defensive work, these Machine Guns will be a source of great strength, and in no country will their defensive use have a more self evident value than in India.

It is not necessary to take up the time of readers in describing the numberless instances during the mutiny in which Machine Guns would have been of untold value. Every European who has lived in India realises what that mutiny was, and also realises that another mutiny is not beyond the bounds of possibility, and he will surely welcome the introduction of any arm which will increase the defensive powers of insulated British communities, as these Machine Guns most undoubtedly would do.

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MACHINE-GUN TACTICS.
*Mr. Nordenfelt's remarks.**Major Gaselee's remarks.*


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Although during the last decades various systems of Machine Guns have been brought before the European Governments, yet it may, without fear of contradiction, be asserted that the Palmcrantz system, as applied to the Nordenfelt Machine Guns, has, for the present proved, for nearly all purposes, the most suitable, and is now representing the only reliable weapon of its class, for which reason also many countries both in and out of Europe are adopting that system.

The Nordenfelt Machine Gun seems to be both of simple mechanism and strong in all its parts.

The spiral springs alone can break, but these can be easily replaced, and an accident to one does not render the remaining barrels inefficient. Simplicity of construction and strength cannot be too strongly insisted on in all weapons placed in the hands of a soldier.

It is our intention in this treatise to confine ourselves to Nordenfelt Guns on the Palmcrantz system, but the tactical considerations which we are going to suggest, will of course also hold good as regards other Machine Guns, when compared with those of the Nordenfelt which they nearest approach in weight.

The Nordenfelt Guns, which are of different kinds and various calibres (from the lowest rifle calibre up to 3 inches), can be classed under the following headings:—

- (a) THE SMALL-BORE GUN of rifle calibre, with 5 or 10 barrels.
- (b) THE ANTI-TORPEDOBOAT-GUN of 1 inch calibre, with 4 or 2 barrels, the latter adapted for heavier charges.
- (c) THE NAVAL GUN of  $1\frac{1}{2}$  inch and  $1\frac{7}{8}$  inch calibre, the former with 1 or 3 barrels, the latter with only one barrel.
- (d) THE FORTIFICATION GUN of 1 inch and  $1\frac{1}{2}$  inch calibre, the former with 2 barrels, and the latter, with 1 or 3 barrels, being a Shell Gun.

*Obs.*—Experiments are also being carried out with a ONE BARREL Machine Gun of 3 INCH CALIBRE, destined some day, perhaps, to become the Field Gun of the future.

- (a) THE SMALL BORE GUN.—The 5-barrelled gun, which may properly be called a Field Machine Gun, is intended for an army in the

The small-bore Nordenfelt (a) can and should be made to use the same ammunition as the infantry weapon of the day in use.

It is much regretted by all practical soldiers that we now have in the Army two kinds of Rifle, necessitating the use of 2 different sorts of ammunition.

It is easy to see how serious consequences might ensue from any mistake in sending up the right kind in the hurry and excitement of an action.

I would most earnestly deprecate the introduction of a third small arm ammunition to add another possible source of confusion.

It seems to me that there is great scope for the employment of Machine Guns such as the 5 and 10-barrelled Nordenfelt, both as guns of position and to accompany an army in the field.

field, not as an independent, however, but rather as an auxiliary arm to be attached to the three chief branches of the service, viz:—

*The Infantry, Cavalry, and Artillery,*  
as well as for the *Engineers.*

FOR THE INFANTRY.—Assuming for argument's sake that a brigade (consisting of four battalions of 800 men each) has six 5-barrelled guns attached to it, let us consider how they should be employed.

A large body of troops advancing against an enemy is always divided into the "ADVANCE GUARD," the "MAIN-BODY," and the "REAR-GUARD."

The "advance guard" should have TWO, the "main-body" THREE, and the "rear-guard" ONE Mitrailleuse attached to them.

If, to begin with, we consider their employment at the very commencement of an engagement, the MITRAILLEUSES WITH THE ADVANCE GUARD ought, in our opinion, to accompany their second supports immediately in its rear, or, when practicable, should be placed on its flanks, advancing from cover to cover, and pouring rapid volleys into the skirmishers' supports, but not into their lines, in order to enable their own troops to save fire as much as possible; but the moment the first shot from the enemy's artillery reaches them, they must retire out of fire, at the same time trying to gain some other protected point nearer the enemy.

I am not, however, in favour of the proposal to attach some of these guns to each arm of the service, but rather consider that they would be employed to greater advantage if organized in special batteries, under the immediate orders of the officer commanding the artillery, and available for disposal in the field as circumstances may direct.

The gun seems to require a certain amount of care in its manipulation, and to obtain proper results from its fire it must be handled by highly trained and cool men, accustomed to its use under all circumstances.

These will be more readily found in the artillery, and the formation of special batteries of the 5-barrelled and 10-barrelled gun would, I think, be the best chance of getting the weapon efficiently handled in conjunction with other branches of the service.

The 5-barrelled gun is adapted for mule carriage, and could be organised and equipped much as the 7-pr. rifled guns now are for use in hilly and mountainous country.

The 10-barrelled gun can be drawn by horses.

Each battery might consist of 12 pieces, with four men for each horse or mule, and a percentage of spare gunners and drivers to allow for casualties.

Each battery could consist of four divisions of 3 pieces each, each division complete in itself, and capable of being detached should it be necessary to do so.

As regards the tactical considerations which should guide the employment of this arm in the field, it seems difficult to say how far it may be used without trenching on the more legitimate duties of the artillery, or, as I should say, of long range guns, carrying a greater weight of projectile.

One point has been proved, that the Machine Gun cannot stand against what is now known as artillery fire.

THE MITRAILLEUSES WITH THE MAIN BODY, which is slowly following its skirmishers, must keep well under cover from the enemy's artillery, with which, as a rule, they should never interchange fire, but when by chance any fresh cover can be found on either flank of the enemy's artillery from which the Mitrailleuse could open an enfilading fire, such a chance should on no account be lost.

As soon as the skirmishers find it impossible to advance any further, and the main body comes up in the front attacking line, the Mitrailleuse ought to look out for some well protected position, from which they would be able, with their decimating fire, to attack the enemy's artillery, while it is directing all its energy against the advancing main-body, before the latter has had time to develop; but this can, however, only be a question of a few moments' action, for as soon as the enemy's artillery fire is directed upon them, they must instantly be off.

A commander of Mitrailleuses should always bear in mind, that whatever he has to do *must be done in half-a-minute at the most*, as he seldom gets an opportunity of any longer duration to fire against the same object or from the same position.

When the advance guard and main body, now joined, are going to attack or storm a position, the Mitrailleuses ought to be in readiness immediately to advance to the enemy's front, where they should firmly stick to their position, in order to be able

Circumstances may occur in which an infantry advance may be materially assisted by the Mitrailleuse close up to the fighting line, but this arm would seem to be specially adapted to covering the advance of infantry to the attack of a position from cover well in rear or flanks of the front attacking line, from which they could fire over the heads of their advancing friends, and keep down the fire of the defenders.

From the same positions they would be able to cover the retirement in the event of the attack being unsuccessful, and give time for the retiring bodies to re-form.

It is probable that in future wars long range firing at a high angle will be much more used, and for this the Machine Gun worked by a cool and steady man seems peculiarly well adapted.

I certainly think that for employment with both advance and rear guards these guns might be useful. It would be easy to detach one or two divisions as required, as is now done with Field Guns.

to pour a destructive fire into the retreating enemy's ranks, or to make a stand against his advancing reserve, thus forming a safe support for their own exhausted troops until the reserves and artillery can come up.

Such a position ought to be chosen, in case of the attack failing, that the Mitrail-leuses will be able to stave off the pursuing enemy till their own troops can rally round their advancing reserves and re-commence action.

**THE MITRAILLEUSE ATTACHED TO THE REAR GUARD**, which should be posted in its rear, must be on the look-out for cavalry attacks or flanking movements by the enemy's infantry, whom it can always engage most effectively with its rapid volley fire, thereby enabling the reserve to come up unmolested.

If the attack succeeds, it should remain somewhat behind in order to check any turning movements attempted by the enemy's reserves, choosing, however, a suitable rallying position for the retreating troops in case of failure.

**THESE** we consider to be the **RULES OF ATTACK.**

**FOR DEFENCE**, any **ABSOLUTE TACTICAL RULES** can scarcely be laid down, unless **THE GENERAL ONE**, that the Mitrail-leuses ought to be placed, as much as possible, in protected positions, from which they can direct their fire against the attacking troops, and always be on the move so as

It would be difficult to over-rate the important part which Machine Guns must play in the defence of a position.

Directed by a cool head, easily placed under cover, mechanically fixed so as to bring their fire on any spot most needed, they are consequently an immense power.

In defence it is easy to ascertain the exact distance of all points.

not to give the enemy's artillery any opportunity of cannonading them.

They should always direct their fire against infantry which might collect in small or large bodies, but never against skirmishers in line, except at the very moment of storming, when their lines are always more or less contracted and irregular, in which disarranged state a few seconds effective fire from the Mitrailleuses might easily check their advance.

When an enemy's artillery, according to the latest tactics adopted by that arm, accompanies its infantry's first line of attack, the Mitrailleuses must endeavour to engage them while unlimbering or limbering up, but never when their guns are in action, unless an enfilading fire can be poured into them.

TWO MITRAILLEUSES should be SPECIALLY TOLD OFF TO direct their whole attention to, and by their rapid fire try to prevent, any flanking movements, which the enemy's infantry or cavalry might attempt.

If the defence succeeds, they should molest the retreating enemy as much as possible, but in the event of its being unsuccessful, they should exert themselves, in conjunction with the reserves, to retain a rallying point for their own troops till they can re-form.

FOR THE CAVALRY.—A cavalry regiment, consisting of 6 squadrons, of 150 men in each squadron, ought to have 3 MITRAILLEUSES attached to it.

over which troops must pass to the attack, and on these points such a leaden hail could be maintained as to render the passage very trying. Here, again, long range fire on the supports and reserves would tell. The ever varying conditions of ground render it impossible to lay down absolute rules for the employment of any arm, but it is easy to see how much these guns would aid in bringing a cross fire to bear on the ground in front the salients of works and other comparatively weak places in a defensive position.

I am averse, as stated above, to attaching the Machine Gun permanently to the cavalry branch, but I quite think, under many circumstances, they could with advantage be used with cavalry or "Mounted Riflemen."

One of the chief services which this arm has to render, according to latest tactics, consists in constituting a kind of screen between the opposing forces; dispatched some seven miles or more ahead of the main body, its duty is partly to reconnoitre the enemy's movements and position, but it is also, and perhaps more so, to prevent them gaining similar information about their own troops; on such occasions the cavalry often encounter small infantry forces, whose fire stops further progress; it is also often desirable for cavalry to retain possession of defiles, bridges, mountain passes, or any other vantage ground which they have occupied, which it is generally very difficult for them to do without the support of infantry, whose arrival they seldom can await; 1 or 2 5-barrelled guns quickly brought to bear on the enemy would in either of those cases be of the greatest value.

**FOR THE ARTILLERY.**—Each division of field artillery (of 2 batteries of 6 guns each battery), ought to have 4 MITRAILLEUSES attached to it.

It is always a difficult problem for a general to manœuvre his troops at all times so as to make sure of his artillery being protected, which is particularly the case when the artillery is posted some distance from the main battle ground; to detach special troops for its support deprives the fighting force of many a fine soldier. Supported by some Mitraileuses on its flanks, the artillery's position would probably be quite safe. During the

In this case they should generally, I think, be on wheels. The pace of the mule battery cannot be estimated at more than four miles an hour.

The commander of artillery would doubtless be able to work his Mitraileuses so as to add to the protection of the guns throwing heavier projectile.

I do not think it advisable to attach Machine Guns to ordinary batteries, because, as I said before, I think they can be more efficiently employed as separate units.

Should guns by chance be left unprotected by infantry, the Machine Guns should render it impossible for cavalry to charge down upon them.

I cannot, however, agree that in handling the three arms there should be any real difficulty in affording mutual support.



moments of unlimbering and limbering up, as well as when changing position, the artillery is often an easy prey to a cavalry force making a bold attack, or infantry stealing their way upon them. If some few *Mitrailleuses* were previously posted where the artillery was going to take up its position, they ought to be able to protect the artillery against such emergencies.

While limbering up, many a battery has been compelled to leave their guns behind, owing to the sudden rush of the enemy's infantry (pouring volleys at short ranges into them during such a critical moment) making their position untenable.

A few *Mitrailleuses* would be sure to keep attacking infantry at bay sufficiently long to allow the gunners to limber up and be off.

It might happen while a battery is taking up a new position, that it is attacked by cavalry or some small infantry force too suddenly to get time to unlimber and defend themselves before both men and horses are shot down; but supported by a few *Mitrailleuses*, which can much more quickly open fire, their movements ought to be much safer.

The preceding suggestions refer to field operations proper; but the small bore *Mitrailleuse* is also, and probably, of its greatest service in what is called "THE SMALL WAR," *i.e.* for reconnoitering purposes in a hostile country, for strengthening and retaining occupied territory,

The conditions of modern warfare do not necessitate infantry being always close by batteries of artillery.

Such a case might occur, but I do not think it ought.

Artillery cannot be expected to clear away for itself or act as the pioneers of an advance. Cavalry or infantry would, I think, generally see the way clear before artillery were ordered to take up a position.

Should such a case occur, I do not quite see how the Machine Gun would help matters, as it too would have to be brought into action.

In employment in fortified posts on lines of communication; in defence of defiles, ridges, causeways, depôts, &c., &c., &c., and for all defensive works of a permanent or temporary nature, I consider the Machine Guns peculiarly suited. In India, more especially, I think their employment would add greatly

defending defiles and bridges situated beyond the area proper of the active army, protecting and defending depôts, lines of communication, railways, canals, convoys of ammunition and provisions, as well as for provisioning and foraging, &c.

To detach larger or smaller forces of cavalry or infantry for all these purposes would absorb such a large portion of the active army that a general must often submit to the alternative of venturing to leave his convoys, &c., unprotected, rather than of risking the safety of the whole army by diminishing its fighting power.

One or some few *Mitrailleuses* employed on such occasions would become a most effective weapon, repaying manifold its small cost. If, for argument's sake, we assume that a *Mitrailleuse* had rendered no other service during the whole war, than merely to protect one single provision train or to defend one single defile, still it would probably have done on the whole as useful a service as several thousand men in the field could have done.

For all the special purposes of "the small war" it seems indispensable to have some extra batteries of 5-barrelled *Mitrailleuses*, not including those which are attached to the infantry brigades, cavalry regiments, or artillery divisions as previously suggested.

**ENGINEERS.**—Some of the engineers ought to be provided with *Mitrailleuses*. A corps of pontooniers, &c., with

to our strength and security. One great source of weakness and anxiety in India is the protection of women and children when troops have to take the field.

This important subject has, of late years, been much under consideration, and I believe *Machine Guns* mounted in the "Places of Refuge" or "Fortified Posts," which it is proposed to have in all military stations, to be used in cases of emergency, would add immensely to the value and security of such positions. It would be easy to quote many instances of recent date in support of this view.

Engineers, like artillery, need protection in their special duties. It is the duty of a commander to afford this protection with the means at his disposal.

their long train, is naturally much exposed to a crafty enemy, especially when occupied with bridging in localities where, considering themselves safe from any attack, they are either left entirely without support, or are only slightly supported.

The 10-BARRELLED Mitrailleses, being considerably heavier than the 5-barrelled, cannot well be considered an entirely suitable arm for service in the field, as it would never have to compete with the enemy's field artillery, and for all other purposes in the actual field it is probably too heavy, and without the portability which would be expected from a field Mitraillease.

In our opinion it ought to belong to the "SIEGE ARTILLERY," AND "ARTILLERY OF POSITION" which combination is now-a-days adopted in most countries.

In the Swedish artillery, for instance, a battery of 6 10-barrelled Mitrailleses is served out to each division of this class of artillery, consisting of 2 batteries of heavy and one battery of light "siege artillery" and "artillery of position," and of one ammunition column.

Well protected behind a wall or similar cover, it will have a good opportunity of developing all its destructive power, strengthening many an otherwise weak position.

It should be posted in the inner angles of a POSITION OR FORTIFICATION, where

In this he could in many instances employ the Mitrailleses with advantage.

I do not think the 10-barrelled gun too heavy for employment as a wheeled gun, and should advocate the adoption of this in larger numbers than the 5-barrelled, as I consider the 5-barrelled better adapted for special work in hilly and mountainous country.

As a gun of position it is undoubtedly superior to the 5-barrelled gun.

This appears to support my view of how the Mitrailleses should be employed, and the arm to which it should belong.

I agree with all the following remarks regarding the employment of the Machine Gun for defensive purposes.

it can occupy and develop a strong defensive position of the ditches; or it should serve as a defence of "gorges" against flanking movements, in which case one or two *Mitrailleuses* ought be detached, which could also join in sorties.

IN SIEGE OPERATIONS it is of the highest importance to be able to protect and defend batteries, earthworks and trenches which are only half complete; the infantry used for that purpose always being in the way of the sappers, and generally much spread about, it is of course very difficult to collect them quickly enough in sufficient numbers to repel the frequent sorties made by the enemy with a view of interrupting and harassing the trench digging.

For protection of ARTILLERY AND FORTIFICATION-PARKS, *Mitrailleuses* should be posted in rear of the besiegers, where they would also form a defence of the camp itself. Again, while earthworks and trenches are thrown up, if any vantage ground could be occupied, the *Mitrailleuses* should certainly avail themselves of it, so as to be better able to repulse attacks, and protect the progress of the "siege operations," although for this particular purpose the 5-barrel gun, on account of its lightness, is perhaps still more suitable.

The usefulness and necessity of adopting *Mitrailleuses* in PERMANENT FORTS for defence of ditches and lines of communication, inside as well as outside

forts, is already an acknowledged fact in most countries.

In the same sense, although perhaps in a still higher degree than as regards forts and fortifications, the *Mitrailleuse* is an important and almost indispensable weapon for DEFENCE OF TEMPORARILY FORTIFIED TOWNS, villages, churches, and buildings adapted for block-houses, &c., &c.

The 10-barrelled gun carries 4,200 rounds on limber and trail.

From the preceding remarks it is evident that, IN MOBILISING, the 10-barrelled *Mitrailleuse* might be required to a much greater extent than what may be merely necessary for service in "siege artillery" and "artillery of position."

As regards the other kinds of Machine Guns enumerated previously, their names partly indicate the purposes for which they are intended, and although we do not purpose here to enter into details as to their use, we may mention, that the FORTIFICATION GUN of 1.5-INCH CALIBRE fires a kind of SHRAPNEL OR CASE SHOT, and is INTENDED FOR DEFENCE OF TRENCHES in lieu of the 10-barrelled *Mitrailleuse*, because the same effect can be produced by a number of small bullets from a case shot as by a volley fire from a 10-barrel gun, and THE ADVANTAGE IS GAINED of being able to fire a few VOLLEYS OF SHELLS when it is found necessary to try to destroy any protection which an assaulting party may bring

with them after they have succeeded in opening a breach and are making an attempt to push their way over the ditches.

With special regard to the ONE BARREL 3-INCH GUN, such a weapon would, indeed, realise the most sanguine dreams of an artilleryman. A field gun, WHICH CAN USE COMPLETE CARTRIDGES WITH SOLID CASES, AND IS AT THE SAME TIME MACHINE LOADING AND FIRING, would be a field gun in the proper sense of that word.

But before this idea can be fully realised (its usefulness as a field gun), it might perhaps be more appropriate to style it a LARGE NAVAL MACHINE-GUN, for use against small FAST-GOING GUN BOATS PARTLY ARMoured, or against the new class of UNARMoured SWIFT CRUISERS which of late years have created some commotion amongst naval men.

The complete Mitrailleuse with THE INFANTRY, including gun proper, carriage and limber, is drawn by ONE HORSE, led by one driver on foot; FOUR MEN, besides the driver, are told off to each weapon to serve it, viz:—

No. 1 lays the gun and fires.

No. 2 attends to and replaces the hoppers.

No. 3 supplies ammunition from the limber.

No. 4 in reserve, fills the magazines from the limber box, in which he is assisted, as often as possible, by the driver.

I have not remarked on the detail required for a battery of these guns, as it is a subject on which an artillery officer's opinion is alone of any value, and it can easily be settled when it is determined to form batteries.

When taken over difficult ground the detachment assists with drag-ropes. They can also, when necessary, carry the gun on their shoulders by means of poles, two men carrying the gun proper, and two the trail, each man being provided with an ammunition knapsack holding 150 rounds of cartridges.

The limber box contains 2,000 rounds and 6 knapsacks.

In each CAVALRY REGIMENT there should be an extra waggon, similar to their ordinary ammunition waggons, but so arranged that it can take all three Mitrailleuses with their trails and ammunition; 6 RESERVE HORSES, with saddles, specially adapted for carrying the guns, are also told off.

When the Mitrailleuses are suddenly ordered ahead to attack or defend some particular point, or on occasions when wheels cannot be used, they are secured to these saddles with their trails and knapsacks, each weapon requiring TWO HORSES.

Besides the 2 horses, 2 MEN are required to lead the loaded horses, and 4 MEN for serving the gun, all mounted. These cavalrists are not told off until the moment the guns are to be used, the men being of course trained to handle the Mitrailleuses.

Mounted in this way Mitrailleuses can be conveyed short distances at a rapid pace, or even tolerably long distances, if

possible injuries to the horses are no consideration.

In the ARTILLERY the Mitrailleuse is drawn by 2 HORSES, and the gun carriage is similar to that of the infantry, except that the poles are secured to the limber underneath, in which the two shafts are put together to serve as a pole. The spare horse which No. 1 rides, has draft harness which can be attached in front of the horses when the ground is heavy; No. 2 and No. 3 ride on the limber; No. 4 rides the off-side horse; and the driver, who also holds No. 1 horse, rides the near-side.

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#### DESCRIPTION OF VARIOUS MACHINE GUNS.

Machine Guns may be classified as follows :—

- I.—Machine Guns firing the same projectiles as the rifle of the country.
  - II.—Machine Guns firing projectiles of larger calibre than rifle calibre, principally for the purpose of penetrating ships' boilers, etc.
- The—Hotchkiss belongs to No. II.  
 The—Nordenfelt to both I. & II.  
 The—Gardener to No. I.

The—Hotchkiss revolving canon, of which a photograph is attached, is more adapted for Naval Warfare, though the Inventor competes with Artillery in firing shells. In this paper, however, the subject of Machine Guns for naval purpose is not dwelt on.

The Nordenfelt Gun, of which photos: are attached, has fixed barrels parallel and level. It fires volleys or single shots at will, and is worked by a lever with a horizontal action. It has an automatic scattering arrangement. (There is another Naval Gun which is not considered in this paper.)

The Gardener Gun (see plate) has fixed barrels and is worked by turning a handle. At present there are single, double and five barrelled Gardener Guns; the single barrel gun is considered by many experts to be the best small-bore Machine Gun that has been invented. Its weight with portable rest and 1,000 cartridges is only 200 lbs. and it can fire 200 rounds per minute.

It does not figure in the extracts from Report on Trial of Machine Guns at Shoeburyness in the spring of 1881,—as the gun was not at that time built.



The following Tables are extracts from the official report of "Experiments with Machine Guns at Shoeburyness" which was laid on the table of the House of Commons in 1881,—the Committee arrived at the conclusion that the Gardener system was the best for land service.

#### PROGRAMME FOR COMPETITIVE TRIAL OF MACHINE GUNS.

##### 1. For Rapidity.

The following trials to be carried out from each gun.

- (a)—Fire for half a minute; number of rounds fired to be noted.\*
- (b)—Fire 1,000 rounds; time to be noted, including all delays.
- (c)—Ascertain the number of rounds that can be fired in 3, 5, and 7 seconds.
- (d)—Ascertain the number of continuous rounds that can be fired by one man without assistance. Time to be noted.
- (e)—Ascertain the number of rounds that can be fired by one man in one minute without assistance.

The above may be fired by Inventors or their Assistants.

##### 2. Accuracy with Deliberation.

- (a)—The guns to be mounted on their own carriages, and one barrel of each fired for accuracy; 3 targets of 20 rounds each at 300, 500, 900, 1,500, and 2,000 yards to be made. A different barrel being used each time. The higher ranges to be subject to modification.
- (b)—Fire 40 rounds from each gun, for figure of merit, at a target at 500 yards range. Three targets to be made.

To be fired by men of the school of Gunnery.

##### 3. Accuracy with Rapidity.

###### *At Stationary Targets.*

- (a)—Without traversing. Fire one round from each barrel of each gun, as fast as possible, at 500 yards range, at target; note time and accuracy. Three targets to be made.
- (b)—Without traversing. Fire 80 rounds from each gun, as fast as possible, at 500 yards range. Note time and accuracy.
- (c)—With automatic scattering motion. Fire for half a minute with automatic gear on at 500 yards range, at rows of 9 feet targets. Repeat with hand scattering gear. The number of troughs and lodges only to be counted.
- (d)—Three fixed 6 feet  $\times$  6 feet targets to be placed at 300, 500, and 700 yards in different directions, as wide apart as the ground will allow. Forty rounds to be fired at each target; the time and number of hits to be noted.

###### *At Moving Targets.*

- (e)—A moveable target, 6 feet  $\times$  12 feet, at 800 yards range, to be caused to move diagonally across the line of fire to a point 400 yards from the gun, at a trot. Number of hits to be noted. The lateral distance travelled to be about 400 yards.

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\* Missfires and other accidents to the cartridge will be noted in all the trials.

To be fired by men of the school of Gunnery.

4. Velocity Trials.

Muzzle velocity of 10 rounds from each gun to be taken.

5. Exposure Trials.

(a)—Guns to be wiped clean, and left uncovered for a week in the open. Before firing half a minute allowed for cleaning, with such material as would be found with the Carriage. Continuous firing for half a minute to be then carried out.

(b)—Each gun to be fired for half a minute and an oscillating overhead sieve filled with dry silver sand.

6. Rough Usage,

A rough usage trial of each gun in marching order will also be carried out. The details of this will be arranged by the Committee hereafter.

Further trials as to suitability for boat and ship work will be afterwards made.

*N. B.*—Any of the above trials may be repeated as often as the Committee consider desirable.

29th November 1880.

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## WEIGHTS OF GUNS.

| GUN.              |     | Weight, exclusive of Feeder. |             |             | Feeder.         | Length of barrel.     |
|-------------------|-----|------------------------------|-------------|-------------|-----------------|-----------------------|
|                   |     | <i>Cwts.</i>                 | <i>qrs.</i> | <i>lbs.</i> | <i>lbs.</i>     |                       |
| 2-barrel Gardener | ... | 0                            | 3           | 17          | 6               | 30 inches.            |
| 5 Do. do.         | ... | 2                            | 2           | 22          | 24              | 30 do.                |
| 10 Do. Nordenfelt | ... | 2<br>(including feeder).     | 1           | 10          | ...             | 32 $\frac{1}{2}$ do.  |
| 5 Do. do.         | ... | 1                            | 1           | 3           | 6 $\frac{1}{2}$ | 26 $\frac{1}{10}$ do. |

1a. RAPIDITY.—Fire for a Half a Minute; Number of rounds to be noted.

Shoeburyness, 13th January 1881.

| GUN.                                                    | Number of Rounds. | Missfires. | REMARKS.                                                                                                                                                                                                                                                           |
|---------------------------------------------------------|-------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2-barrel Gardener                                       | 195               | 2          | Mr. Gardener and one Assistant.                                                                                                                                                                                                                                    |
| 5 Do. do.                                               | 286               | 1          | Allowed for each Jam at 21 seconds.<br>jam, so that total<br>time of firing was } " 24 "<br>30 seconds. } " 28 "                                                                                                                                                   |
| Do. do. (repetition)<br><i>Fired 2nd February 1881.</i> | 330               | 1          | Slight hitch at nine seconds, but no stoppage.                                                                                                                                                                                                                     |
| 10-barrel Nordenfelt                                    | 430               | ...        | Mr. Nordenfelt's friend and two Assistants.<br><br>Nine passed through unfired. Cause—one had failed to extract, rim having given way. Cartridges represented this barrel failed to fire, and dropped through action. Mr. Nordenfelt showed how this was effected. |
| 5 Do. do.                                               | 310               | 2          | Mr. Nordenfelt and two Assistants.<br><br>Four passed through gun unfired.<br><br>( <i>This occurs when the lever is not pressed fully to the front.</i> )                                                                                                         |

1b. RAPIDITY.—Fire 1,000 Rounds; time to be noted including all delays.

Shoeburyness, 13th January 1881.

| GUN.                                          | Number of Rounds. | Time. |       | Missfires.    | REMARKS.                                                                                                                                                                                    |
|-----------------------------------------------|-------------------|-------|-------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               |                   | Min.  | Secs. |               |                                                                                                                                                                                             |
| 2-barrel Gardener ...                         | 1,000             | 2     | 57    | ...           | Mr. Gardener and two Assistants.<br>Sandbag on seat and point of trail.<br>No relief on firing handle.<br>Slight hitch at 35".                                                              |
| 5 Do. Do. ...<br><i>Fired 2nd Feby. 1881.</i> | 1,000             | 1     | 35    | 6 well struck | No jams. No relief on firing handle.                                                                                                                                                        |
| 10-barrel Nordenfelt ...                      | 969               | 1     | 21    | 1             | Mr. Nordenfelt and two Assistants.<br>Backed crank at 20"; some fell through.<br>31 passed through unfired, owing to having to back the action; of these only four had the bullets damaged. |
| 5 Do. Do. ...                                 | 1,019             | 2     | 43    | 2             | Relief on firing handle at 40" and 1' 20".<br>Jam, necessitating opening action and using rammer at 1' 50."                                                                                 |

1c. RAPIDITY.—Ascertain the number of rounds that can be fired in 3, 5 and 7 seconds.

Shoeburyness, 13th January 1881.

| GUN.                                     | 3 Secs. | Missfires. | 5 Secs. | Missfires. | 7 Secs. | Missfires. | REMARKS.                        |
|------------------------------------------|---------|------------|---------|------------|---------|------------|---------------------------------|
|                                          | Rounds. |            | Rounds. |            | Rounds. |            |                                 |
| 2-barrel Gardener<br>(Total 431 rounds). | 22      | ...        | 50      | ...        | 61      | ...        | Mr. Gardener and one Assistant. |
|                                          | 34      | 1          | 51      | ...        | 68      | ..         |                                 |
|                                          | 33      | ...        | 48      | ...        | 64      | ..         |                                 |
| MEAN ... ..                              | 29.7    | ...        | 49.7    | ...        | 64.3    | ...        |                                 |

1c. RAPIDITY.—Ascertain the number of rounds that can be fired in 3, 5 and 7 seconds.—*Continued.*

| GUN.                                                     | 3 Secs.                            | Missfires.               | 5 Secs.                                      | Missfires.      | 7 Secs.                                                                                                                                | Missfires.                  | REMARKS.                                                                                                                                                                                                               |
|----------------------------------------------------------|------------------------------------|--------------------------|----------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2-barrel Gardener<br>(repeat 3 secs.)...<br>(96 rounds). | <i>Rounds.</i><br>32<br>32<br>32   | ...                      | <i>Rounds</i><br>...<br>1 well struck.       | ...             | <i>Rounds.</i><br>...<br>...                                                                                                           | ...                         | 27th January 1881.                                                                                                                                                                                                     |
| MEAN ... ..                                              | 32                                 | ...                      |                                              |                 |                                                                                                                                        |                             |                                                                                                                                                                                                                        |
| 5-barrel Gardener<br>(Total 795 rounds).                 | 45<br>60<br>60                     | ...<br>2<br>...          | 75<br>Hand slipped<br>off crank.<br>80<br>90 | ...<br>1<br>... | Hitch at 2<br>secs; repeat.<br>110<br>110<br>50<br>Jam; repeat.<br>115                                                                 | ...<br>1<br>...<br>...<br>2 | 13th January 1881.                                                                                                                                                                                                     |
| MEAN ... ..                                              | 55                                 | ...                      | 81.7                                         | ...             | 111.6                                                                                                                                  | ...                         |                                                                                                                                                                                                                        |
| 10-barrel Nordenfelt<br>(Total 943 rounds)               | 70<br>80<br>80<br>slight<br>hitch. | ...<br>...<br>...<br>... | 110<br>120<br>120                            | ...<br>1<br>... | 70<br>Jam at about<br>3 secs.<br>70<br>Jam in 4th<br>barrel.<br>83<br>Jam in 5th<br>barrel; re-<br>peat, with<br>oiled cart-<br>ridge. | ...<br>...<br>...<br>...    | 2nd February 1881.<br>Mr. Nordenfelt and one<br>Assistant.<br>One cartridge failed to<br>extract in 10th barrel.<br>Eight passed through, of<br>which four were da-<br>maged.<br>Seven passed through, all<br>damaged. |
| MEAN ... ..                                              | 76.7                               | ...                      | 116.7                                        | ...             | 140                                                                                                                                    | ...                         | No Jams.                                                                                                                                                                                                               |
| 5-barrel Nordenfelt<br>(Total 665 rounds).               | 50<br>50<br>50                     | ...<br>...<br>...        | 75<br>75<br>70                               | 1<br>...<br>... | 100<br>95<br>100                                                                                                                       | ...<br>2<br>1               | 13th January 1881.<br>No hitches.                                                                                                                                                                                      |
| MEAN ... ..                                              | 50                                 | ...                      | 73.3                                         | ...             | 98.3                                                                                                                                   | ...                         |                                                                                                                                                                                                                        |

1 *e.* RAPIDITY.—Ascertain the Number of Rounds that can be fired by one man in one minute without assistance.

Shoeburyness, 14th January 1881.

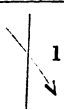
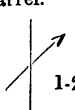
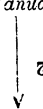
| GUN.                     | Conditions.                                               | Number of Rounds. | Missfires. | REMARKS.                                                      |
|--------------------------|-----------------------------------------------------------|-------------------|------------|---------------------------------------------------------------|
| 2-barrel Gardener ...    | Limber box, with cart-ridge feeds. Two sandbags on trail. | 224               | 1          | Fired by Mr. Gardener. Two false starts, and then a good run. |
| 5-barrel Gardener ...    | ditto ditto ...                                           | 340               | 1          |                                                               |
| 10-barrel Nordenfelt ... | Hopper in box on left side of trail.                      | 590               |            |                                                               |
| 5-barrel ditto ...       | Limber box.                                               | 238               | 1          | 2nd February 1881.<br>Hitch from taking off hopper too soon.  |
| Ditto (repeat) ...       | ditto ...                                                 | 348               | 2          | No Jams. Two passed thro' unfired.                            |

300 Yards Range.

2 *a.* ACCURACY with DELIBERATION.—The Guns to be mounted on their own Carriages, and one barrel of each fired for accuracy. Three Targets, 20 rounds each, at 300, 500, 900, 1,500 and 2,000 yards, to be made, a different barrel being used each time.

Range, 300 Yards. 9' × 9' Target.

Shoeburyness, 17th January 1881.

| GUN.                               | Series. | Dimensions of Rectangle containing Hits. |                | Number of Hits. | REMARKS.                                                                                                                                                                                                              |
|------------------------------------|---------|------------------------------------------|----------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                    |         | Vertical.                                | Horizontal.    |                 |                                                                                                                                                                                                                       |
| 2-barrel Gardener—<br>3 rounds ... | ...     | <i>Ft. in.</i>                           | <i>Ft. in.</i> | ...             |                                                                                                                                                                                                                       |
|                                    | 1st ... | 1 3                                      | 3 4            | 20              | <br>Trial shots.<br>Right barrel.<br>Gun worked a little to right.<br>One shot in this series fired accidentally from left barrel. |
|                                    | 2nd ... | 2 11                                     | 3 3            | 20              | <br>Left barrel.<br>Gun worked to right.                                                                                           |
|                                    | 3rd ... | 2 4                                      | 2 6            | 20              | Right barrel.<br>Gun worked to right.                                                                                                                                                                                 |
| 5-barrel Gardener 3 do.            | ...     | ...                                      | ...            | ...             | 14th January 1881.                                                                                                                                                                                                    |
|                                    | 1st ... | 2 0                                      | 1 5            | 20              | <br>Trial shots.                                                                                                                   |
|                                    | 2nd ... | 2 1                                      | 1 6            | 20              |                                                                                                                                                                                                                       |
|                                    | 3rd ... | 1 5                                      | 1 10           | 20              |                                                                                                                                                                                                                       |

## 300 Yards Range.—(Continued).

2 a. ACCURACY with DELIBERATION.—The Guns to be mounted on their own Carriages, and one barrel of each fired for accuracy. Three Targets, 20 rounds each, at 300, 500, 900, 1,500, and 2,000 yards, to be made, a different barrel being used each time.

Range, 300 Yards ; 9' × 9' Target.

Shoeburyness, 17th January 1881.

| GUN.                 | Series.    | Dimensions of Rectangle containing Hits. |             | Number of Hits. | REMARKS.                                                         |
|----------------------|------------|------------------------------------------|-------------|-----------------|------------------------------------------------------------------|
|                      |            | Vertical.                                | Horizontal. |                 |                                                                  |
| 4th February 1881.   |            |                                          |             |                 |                                                                  |
| 10-barrel Nordenfelt | 1st        | 2·9                                      | 6·2         | 20              | This series by mistake in two volleys.<br>Repeat.                |
|                      | 2nd        | 1·1                                      | 1·7         | 19              | No. 1 barrel.                                                    |
|                      | 3rd        | 1·0                                      | 1·2         | 20              | No. 5 do.                                                        |
|                      | 4th        | 1·2                                      | 0·9         | 20              | No. 10 do.                                                       |
| 17th January 1881.   |            |                                          |             |                 |                                                                  |
| 5 Ditto              | { 3 rounds | ...                                      | ...         | ...             | Trial shots, a little low.                                       |
| 3 „                  | „          | ...                                      | ...         | ...             | Ditto all right.                                                 |
|                      | 1st        | 1 10                                     | 1 4         | 20              | Right barrel.<br>Gun seemed to have travelled a little to right. |
|                      | 2nd        | 1 5                                      | 2 9         | 20              | Left barrel.<br>Gun now travelled slightly to left.              |
|                      | 3rd        | 2 3                                      | 2 0         | 20              | Centre barrel.<br>Gun still travelled slightly to left.          |

## 500 Yards Range.

2 a. ACCURACY with DELIBERATION.—The Guns to be mounted on their own Carriages, and one barrel of each fired for accuracy. Three Targets of 20 rounds each, at 300, 500, 900, 1500 and 2000 yards, to be made, a different barrel being used each time.

Range, 500 yards, 9' × 9' Target.

Shoeburyness, 17th January 1881.

| GUN.                              | Series. | Dimensions of Rectangle containing Hits. |                  | Number of Hits. | REMARKS.                                                                                          |
|-----------------------------------|---------|------------------------------------------|------------------|-----------------|---------------------------------------------------------------------------------------------------|
|                                   |         | Verti-<br>cal.                           | Hori-<br>zontal. |                 |                                                                                                   |
|                                   |         | <i>Ft. in.</i>                           | <i>Ft. in.</i>   |                 |                                                                                                   |
| 2-barrel Gardener—<br>3 rounds... | ...     | ...                                      | ...              | ...             | Trial shots.                                                                                      |
|                                   | 1st ... | 4 1                                      | 4 2              | 20              | Right barrel.<br>One accidentally from left barrel.                                               |
|                                   | 2nd...  | 2 9                                      | 2 10*            | 20              | Left barrel<br>*One abnormal.                                                                     |
|                                   | 3rd...  | 3 8                                      | 2 1              | 20              | Right barrel.<br>One accidentally from left barrel.                                               |
| 5 barrel Gardener—<br>3 rounds... | ...     | ...                                      | ...              | ...             | Trial shots.                                                                                      |
| Ditto 3 do. ...                   | ...     | ...                                      | ...              | ...             | Do.                                                                                               |
|                                   | 1st ... | 3 7                                      | 2 10             | 20              | Right barrel.                                                                                     |
|                                   | 2nd...  | 3 4                                      | 2 10             | 20              | Centre „                                                                                          |
|                                   | 3rd...  | 3 2                                      | 2 8              | 19              | Left „                                                                                            |
|                                   |         | <i>Feet.</i>                             | <i>Feet.</i>     |                 | 4th February 1881.                                                                                |
| 10-barrel Nordenfelt ...          | 1st ... | 1'3                                      | 2'1              | 20              | No. 1 barrel.                                                                                     |
|                                   | 2nd ..  | 2'2                                      | 2'1              | 20              | No. 5 „                                                                                           |
|                                   | 3rd...  | 2'6                                      | 2'3              | 20              | No. 10 „                                                                                          |
|                                   |         | <i>Ft. in</i>                            | <i>Ft. in.</i>   |                 | 17th January 1881.                                                                                |
| 5-barrel do. 3 rounds             | ...     | ...                                      | ...              | ...             | Trial shots.                                                                                      |
|                                   | 1st ... | 3 3                                      | 1 9              | 20              | Left barrel.                                                                                      |
|                                   | 2nd...  | ...                                      | ...              | 4               | Right „<br>Repeat.                                                                                |
|                                   | 2nd..   | 2 9                                      | 1 10             | 19†             | Right barrel. { †One round struck.<br>One missfire. { One picked up in<br>front.<br>One abnormal. |
|                                   | 3rd...  | 2 9                                      | 1 11             | 20              | Centre barrel.                                                                                    |



## 900 Yards Range.

2 a. ACCURACY WITH DELIBERATION. The Guns to be mounted on their own carriages, and one barrel of each fixed for accuracy. Three Targets of 20 rounds each, at 300, 500, 900, 1500 and 2000 yards, to be made, a different barrel being used each time.

Shoeburyness, 13th January 1881.

| GUN.                                 | Series. | Dimensions of Rectangle containing Hits. |                | Number of Hits. | REMARKS.                                                                                                                                  |
|--------------------------------------|---------|------------------------------------------|----------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |         | Vertical.                                | Horizontal.    |                 |                                                                                                                                           |
| 2-barrel Gardener—<br>4 rounds...    | ...     | <i>Ft. in.</i>                           | <i>Ft. in.</i> | ...             | Sandbags on all 3 legs, and one on seat.                                                                                                  |
|                                      | 1st ... | 5.8 ...                                  | 3.8 ...        | 20              | Trial shots.                                                                                                                              |
|                                      |         |                                          |                |                 | Line and elevation corrected after 10 rounds.                                                                                             |
|                                      |         |                                          |                |                 | Elevation had increased at end of series.                                                                                                 |
|                                      |         |                                          |                |                 | Gun nearly off target to right.                                                                                                           |
|                                      | 2nd...  | 6.6 ...                                  | 7.2 ...        | 16              | All hits, but high up.                                                                                                                    |
|                                      |         |                                          |                | 3 ricochets.    | Neither line nor elevation altered throughout.                                                                                            |
|                                      | 3rd ... | 7.2 ...                                  | 8 ...          | 20              | Elevation altered slightly after 1st 10 rounds.                                                                                           |
|                                      |         |                                          |                |                 | Corrected. Had not altered at end of series.                                                                                              |
| 5-barrel Gardener—<br>5 rounds...    | ...     | ...                                      | ...            | ...             | Trial shots, four hits, one miss, too high.                                                                                               |
| 5 " ...                              | ...     | ...                                      | ...            | ...             | Ditto all right.                                                                                                                          |
|                                      | 1st ... | 3.5 ...                                  | 4 ...          | 20              | No. 1 barrel.                                                                                                                             |
|                                      |         |                                          |                |                 | (Elevation increased slightly after 10 rounds).                                                                                           |
|                                      | 2nd...  | 6.1 ...                                  | 7.6 ...        | 20              | No. 2 barrel.                                                                                                                             |
|                                      | 3rd...  | 8.1 ...                                  | 3.8 ...        | 20              | No. 3 "                                                                                                                                   |
| 10-barrel Nordenfelt—<br>5 rounds... | ...     | ...                                      | ...            | ...             | 7th February 1881.                                                                                                                        |
| 5 " ...                              | ...     | ...                                      | ...            | ...             | Trial shots.                                                                                                                              |
| 5 " ...                              | ...     | ...                                      | ...            | ...             | ditto.                                                                                                                                    |
|                                      | 1st ... | 6.5 ...                                  | 3.3 ...        | 19              | ditto.                                                                                                                                    |
|                                      | 2nd...  | 5.5 ...                                  | 3.9 ...        | 20              | No. 2 barrel.                                                                                                                             |
|                                      | 3rd ... | 6.2 ...                                  | 3.3 ...        | 20              | No. 4 "                                                                                                                                   |
| 5-barrel Nordenfelt—<br>5 rounds...  | ...     | ...                                      | ...            | ...             | No. 6 "                                                                                                                                   |
| 5 " ...                              | ...     | ...                                      | ...            | ...             | Trial shots ... { 3 ricochets.                                                                                                            |
|                                      |         |                                          |                |                 | { 1 direct.                                                                                                                               |
|                                      |         |                                          |                |                 | { 1 miss.                                                                                                                                 |
|                                      | 1st ... | 8.2 ...                                  | 3 ...          | 20              | Do. All hit, but scattered all over the target.                                                                                           |
|                                      |         |                                          |                |                 | Right barrel.                                                                                                                             |
|                                      |         |                                          |                |                 | The gun required constant redirecting, although sandbags were under each wheel, and the trail abuted against and rested on an iron plate. |
|                                      | 2nd...  | 11.6 ...                                 | 5 ...          | 20              | Fired in series of five, for first 10 shots, then, finding that gun acquired 12' elevation in 5 rounds, laid every two or three rounds.   |
|                                      | 3rd ... | 9.4 ...                                  | 3.8 ...        | 20              | Laid each round.                                                                                                                          |
|                                      |         |                                          |                |                 | Gun moved very slightly almost every shot.                                                                                                |



2 b. ACCURACY with DELIBERATION.—Fire 40 rounds from each Gun, for figure of Merit, at a Target 500 Yards Range; three Targets to be made.

Shoeburyness, 25th January 1881.

| GUN.                                 | Series. | Dimensions of Area containing Hits. |              | Number of Hits. | Figure of Merit. | REMARKS.                                                                                |
|--------------------------------------|---------|-------------------------------------|--------------|-----------------|------------------|-----------------------------------------------------------------------------------------|
|                                      |         | Vertical.                           | Horizontal.  |                 |                  |                                                                                         |
|                                      |         | <i>Feet.</i>                        | <i>Feet.</i> |                 |                  |                                                                                         |
| 2-barrel Gardener—<br>4 rounds ...   | ...     | ...                                 | ...          | ...             | ...              | Trial shots, too high.                                                                  |
| 4 „ ...                              | ...     | ...                                 | ...          | ...             | ...              | Ditto too low.                                                                          |
|                                      | 1st ... | 4.1                                 | 5.7          | 40              | 21               | Gun rose very slightly after each 20 rounds.                                            |
|                                      | 2nd ... | 5.3                                 | 9.2          | 40              | ...              | Ditto ditto ditto                                                                       |
|                                      | 3rd ... | 4.8                                 | 6.9          | 39              | ...              | Ditto ditto ditto                                                                       |
|                                      |         |                                     |              | 1 ricochet.     |                  |                                                                                         |
| 5-barrel Gardener—<br>12 rounds ..   | ...     | ...                                 | ...          | ...             | ...              | Trial shots.                                                                            |
|                                      | 1st ... | 3.4                                 | 3.7          | 40              | 13.5             |                                                                                         |
|                                      | 2nd ... | 4.6                                 | 3.1          | 40              | ...              | 3' less elevation.                                                                      |
|                                      | 3rd ... | 3.6                                 | 4.8          | 40              | ...              |                                                                                         |
|                                      |         |                                     |              |                 |                  | 4th Febrnary 1881.                                                                      |
| 10-barrel Nordenfelt ...             | 1st ... | 3.2                                 | 3.6          | 40              | ...              | Deliberately.                                                                           |
|                                      | 2nd ... | 3.6                                 | 3.4          | 40              | ...              |                                                                                         |
|                                      | 3rd ... | 3.5                                 | 2.8          | 40              | 13.2             |                                                                                         |
|                                      |         |                                     |              |                 |                  | 31st January 1881.                                                                      |
| 5-barrel Nordenfelt—<br>5 rounds ... | ..      | ...                                 | ...          | ...             | ...              | Trial shots.                                                                            |
|                                      | 1st ... | 6.6                                 | 9.6          | 39              | ...              | Fired with great deliberation, as it was found necessary to relay the gun between each. |
|                                      | 2nd ... | 6.3                                 | 5.6          | 40              | 23.16            | Point laid on centre of 18' x 9' target.                                                |
|                                      | 3rd ..  | 6.4                                 | 5.0          | 36              | ...              |                                                                                         |

3 a. ACCURACY WITH RAPIDITY.—At Stationery Targets, withouts Traversing. Fire one Round from each barrel of each Gun, as fast as possible, at 500 yards Range, at Target. Note time and accuracy; Targets to be made.

Shoeburyness, 26th January 1881.

| GUN.                                  | Series. | Dimensions of Rectangle. |              | Number of Hits. | REMARKS.                                                                                                                                  |                                                                                                                                                                                       |
|---------------------------------------|---------|--------------------------|--------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |         | Vertical.                | Horizontal.  |                 |                                                                                                                                           |                                                                                                                                                                                       |
| <i>Wind calm.</i>                     |         |                          |              |                 |                                                                                                                                           |                                                                                                                                                                                       |
| 2-barrel Gardener—<br>1 round ...     | ...     | <i>Feet.</i>             | <i>Feet.</i> | ...             | Trial shot.                                                                                                                               |                                                                                                                                                                                       |
|                                       | 1       | 0·7                      | 2·0          | 2               |                                                                                                                                           |                                                                                                                                                                                       |
|                                       | 2       | 2·9                      | 1·6          | 2               |                                                                                                                                           |                                                                                                                                                                                       |
| 5-barrel Gardener—<br>4 rounds ...    | 3       | 3·2                      | 2·0          | 2               | Trial shots.                                                                                                                              |                                                                                                                                                                                       |
|                                       | ...     | ...                      | ...          | ...             |                                                                                                                                           |                                                                                                                                                                                       |
|                                       | 1       | 4·7                      | 2·0          | 4               |                                                                                                                                           |                                                                                                                                                                                       |
| Do. Repeat ...                        | 2       | 3·4                      | 1·8          | 3               | Locks so fitted as to fire simultaneously.<br>Four hits extreme right edge, shifted bulls' eye to left edge.                              |                                                                                                                                                                                       |
|                                       | 3       | 4·2                      | 1·1          | 5               |                                                                                                                                           |                                                                                                                                                                                       |
|                                       | 4       | 4·7                      | 2·1          | 5               |                                                                                                                                           |                                                                                                                                                                                       |
| 10-barrel Nordenfelt—<br>9 rounds ... | ...     | ...                      | ...          | ...             | 4th February 1881.<br>Trial shots.<br>Very rapidly,<br>9' x 18' target.<br>Laying on bottom of bulls' eye in centre of two, as in sketch. |                                                                                                                                                                                       |
|                                       | 1       | 2·6                      | 3·0          | 4               |                                                                                                                                           |                                                                                                                                                                                       |
|                                       | 2       | 3·2                      | 10·1         | 9               |                                                                                                                                           |                                                                                                                                                                                       |
| 5-barrel Nordenfelt—<br>3 rounds ...  | 3       | 3·7                      | 8·8          | 9               |                                                         |                                                                                                                                                                                       |
|                                       | 4       | 2·8                      | 8·1          | 8               |                                                                                                                                           |                                                                                                    |
|                                       | 5       | 4·0                      | 8·8          | 10 |  |  | Bulls' eye as above. |
| 5-barrel Nordenfelt—<br>3 rounds ...  | 6       | 3·2                      | 9·8          | 10              | Bulls' eye moved to centre again.                                                                                                         |                                                                                                                                                                                       |
|                                       | 7       | 3·0                      | 8·3          | 9               |                                                                                                                                           | Trial shots.<br>Four hits, firing threw the gun clean off target to left.<br><i>Repeat.</i><br>One miss.<br>Gun has moved to left edge, after firing.<br>Gun moved less.<br>One miss. |
|                                       | ...     | ...                      | ...          | ...             |                                                                                                                                           |                                                                                                                                                                                       |
| 5-barrel Nordenfelt—<br>3 rounds ...  | 1       | ...                      | ...          | ...             | One miss.<br>Gun has moved to left edge, after firing.<br>Gun moved less.<br>One miss.                                                    |                                                                                                                                                                                       |
|                                       | 2       | 4·7                      | 4·0          | 4               |                                                                                                                                           | One miss.                                                                                                                                                                             |
|                                       | 3       | 5·8                      | 4·2          | 4 |  |  | One miss. |
| 5-barrel Nordenfelt—<br>3 rounds ...  | 4       | 5·3                      | 5·1          | 5               | One miss.                                                                                                                                 |                                                                                                                                                                                       |
|                                       | 5       | 3·6                      | 2·9          | 4               |                                                                                                                                           | One miss.                                                                                                                                                                             |
|                                       | 6       | 6·7                      | 4·1          | 5 |  |  | One miss. |
| 5-barrel Nordenfelt—<br>3 rounds ...  | 7       | 2·6                      | 4·6          | 5               | One miss.                                                                                                                                 |                                                                                                                                                                                       |
|                                       | ...     | ...                      | ...          | ...             |                                                                                                                                           | One miss.                                                                                                                                                                             |
|                                       | 1       | ...                      | ...          | ...             |                                                                                                                                           |                                                                                                                                                                                       |

3 b. ACCURACY WITH RAPIDITY.—At Stationary Target, without Traversing. Fire 80 rounds from each Gun as fast as possible, at 500 yards Range. Note time and accuracy. Guns laid and fired by Assistant Superintendent of Experiments, feeding by one Inventor and one of his Assistants except in case of Pratt-Whitney, which was served entirely by School of Gunnery.

Shoeburyness, 26th January 1881.

| GUN.                                 | Dimensions of Rectangle. |              | Number of Hits. | Time.               | REMARKS.                                                                                                                                                                                                                                    |
|--------------------------------------|--------------------------|--------------|-----------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | Vertical.                | Horizontal.  |                 |                     |                                                                                                                                                                                                                                             |
|                                      | <i>Feet.</i>             | <i>Feet.</i> |                 | <i>Secs.</i>        | <i>Wind Calm.</i>                                                                                                                                                                                                                           |
| 2-barrel Gardener—<br>2 rounds ...   | ...                      | ...          | ...             | ...                 | Trial shots.                                                                                                                                                                                                                                |
|                                      | 10·6                     | 7·6          | 74              | 10·5                | Muzzle rose 11 mins.<br>Slight check midway in series.<br>A full ammunition box on trail.                                                                                                                                                   |
| 5-barrel Gardener—<br>5 rounds ...   | ...                      | ...          | ...             | ...                 | Trial shots.                                                                                                                                                                                                                                |
|                                      | 12·8                     | 11·4         | 62              | 6·0                 | Barrels adjusted for volley firing.<br>18 Misses.<br>Hand slipped off firing handle,<br>lost 1 Second.<br>Quadrant on barrels after series<br>showed that elevation had in-<br>creased 27'.                                                 |
| Do. (Repeat) ...                     | 11·0                     | 10·0         | 78              | } not ob-<br>served | Locks altered to fire in succession.<br>Hitch at 7 secs. overcome. Four<br>not fired, two missfires, and one<br>pinched ; four put in again, and<br>one to finish volley.<br>Gun had travelled slightly to right.<br>Elevation not changed. |
| 10-barrel Nordenfelt ...             | 6·8                      | 16·0         | 77              |                     | 4th February 1881.                                                                                                                                                                                                                          |
|                                      |                          |              |                 |                     | 27th January 1881.                                                                                                                                                                                                                          |
| 5-barrel Nordenfelt—<br>5 rounds ... | ...                      | ...          | ...             | ...                 | Trial shots.                                                                                                                                                                                                                                |
|                                      | 15·4                     | 13·0         | 62              | 10·0                | 18 misses.<br>Gun had moved till sight was on<br>left-hand top corner of target,<br>acquiring 2" more elevation.                                                                                                                            |


3 c. ACCURACY WITH RAPIDITY.—A Stationary Target, with automatic scattering motion. Fire for Half Minute, with automatic gear on, at 500 yards Range, at twelve 9 feet Targets. The Throughs and Lodges only to be counted.

Gun worked by Inventors and their Assistants, except Pratt-Whitney.  
Shoeburyness, 26th January 1881.

|                            | GUN.                        | Number of rounds fired. | Number of Hits obtained. | Feet spread over. | Disabled.        |                  | REMARKS.                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------------------------|-------------------------|--------------------------|-------------------|------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                             |                         |                          |                   | Cavalry.         | Infantry.        |                                                                                                                                                                                                                                                                                                                                |
| Hand-scattering Gear.      | 2-barrel—<br>Gardener...    | 2<br>2<br>175           | ...<br>...<br>39         | ...<br>...<br>100 | ...<br>...<br>17 | ...<br>...<br>13 | 12 targets (9' x 9'); scattering arrangements set to cover from bulls'-eye to bulls'-eye of flank targets.<br><br>Trial shots, missed.<br>Ditto.<br>Slight check at 27 secs.<br>Gun increased its elevation, and many shots went over.<br>Captain O'Callaghan fired with two S. G. men to feed and manipulate scattering gear. |
|                            | 2 do. (repeat).             | 4<br><br>182            | ...<br><br>124           | ...<br><br>103    | ...<br><br>39    | ...<br><br>38    | <i>2nd February 1881.</i><br><br>Trial shots.<br>Quadrant after series shows that gun has acquired 24' more elevation. Only 16 hits pointed out.<br>One missfire.<br>Two sandbags on trail.<br>Gun had risen 6'.                                                                                                               |
|                            | 5-barrel—<br>Gardener...    | 5<br>5<br>300           | ...<br>...<br>152        | ...<br>...<br>93  | ...<br>...<br>46 | ...<br>...<br>31 | Trial shots; one hit top of target.<br>Do. Still rather high.<br>Hitch about half-way; overcome. Mr. Gardener stopped to take off his necktie. Lost about 5 seconds.<br>Five rounds fired accidentally in emptying Gun.<br>Gun had risen 13'.                                                                                  |
|                            | 10-barrel—<br>Nordenfelt... | 10<br>10<br>390         | ...<br>...<br>346        | ...<br>...<br>99  | ...<br>...<br>61 | ...<br>...<br>74 | Trial shots.<br>Ditto.<br>One Cartridge upset in hopper, had to be righted by needle.                                                                                                                                                                                                                                          |
| Automatic Scattering Gear. | 5 Ditto.                    | 5<br>315                | ...<br>146               | ...<br>101        | ...<br>50        | ...<br>46        | Trial shots.                                                                                                                                                                                                                                                                                                                   |

- 3 d. ACCURACY WITH RAPIDITY AT STATIONARY TARGETS.—Three 6' x 6' Targets, to be placed at 300, 500 & 700 yards, in different directions, as wide apart as the ground will allow; 40 rounds to be fired at each target; Time and number of hits to be noted.

Shoeburyness, 3rd February 1881.

| GUN.                                                     | Time.                      | Number of Hits. |       | REMARKS.                                                                                                |
|----------------------------------------------------------|----------------------------|-----------------|-------|---------------------------------------------------------------------------------------------------------|
|                                                          |                            | Min.            | Secs. |                                                                                                         |
| 2-barrel Gardener,<br>120 rounds ...                     | 16 rounds at 700 yards ... | ...             | ...   | Trial shots.           |
|                                                          | Firing at 700 „ ...        | 0               | 6     |                                                                                                         |
|                                                          | Laying at 500 „ ...        | 0               | 24    |                                                                                                         |
|                                                          | Firing at 500 „ ...        | 0               | 6     |                                                                                                         |
|                                                          | Laying at 300 „ ...        | 0               | 24    |                                                                                                         |
|                                                          | Firing at 300 „ ...        | 0               | 5     |                                                                                                         |
|                                                          | TOTAL ...                  | 1               | 5     |                                                                                                         |
| 5-barrel Gardener,<br>120 rounds ...                     | 5 rounds at 700 yards ...  | ...             | ...   | Trial shots 1 missfire.<br>Fired by Mr. Gardener<br>and two Assistants.                                 |
|                                                          | Firing at 700 „ ...        | 0               | 5     |                                                                                                         |
|                                                          | Laying at 500 „ ...        | 0               | 30    |                                                                                                         |
|                                                          | Firing at 500 „ ...        | 0               | 4     |                                                                                                         |
|                                                          | Laying at 300 „ ...        | 0               | 26    |                                                                                                         |
|                                                          | Firing at 300 „ ...        | 0               | 4     |                                                                                                         |
|                                                          | TOTAL ...                  | 1               | 9     |                                                                                                         |
| 10-barrel Norden-<br>felt, 120 rounds...                 | 5 rounds at 700 yards ...  | ...             | ...   | Mr. Nordenfelt and<br>two Assistants.<br>Trial shots.<br>Bad light.<br>2 Ricochets.                     |
|                                                          | 5 rounds at 300 „ ...      | ...             | ...   |                                                                                                         |
|                                                          | Firing at 700 „ ...        | 0               | 2½    |                                                                                                         |
|                                                          | Laying at 500 „ ...        | 0               | 13½   |                                                                                                         |
|                                                          | Firing at 500 „ ...        | 0               | 3     |                                                                                                         |
|                                                          | Laying at 300 „ ...        | 0               | 13½   |                                                                                                         |
|                                                          | Firing at 300 „ ...        | 0               | 2½    |                                                                                                         |
|                                                          | TOTAL ...                  | 0               | 35    |                                                                                                         |
| 10-barrel Norden-<br>felt, (repeat)—<br>(120 rounds) ... |                            | Secs.           |       | 4th February 1881.<br>Mr. Nordenfelt and<br>two Assistants.<br>Wind blowing into<br>face of man laying. |
|                                                          | Firing at 700 yards ...    | 2.5             | 17    |                                                                                                         |
|                                                          | Laying at 500 „ ...        | 18.5            | ...   |                                                                                                         |
|                                                          | Firing at 500 „ ...        | 2.5             | 19    |                                                                                                         |
|                                                          | Laying at 300 „ ...        | 16.5            | ...   |                                                                                                         |
|                                                          | Firing at 300 „ ...        | 2.0             | 29    |                                                                                                         |
|                                                          | TOTAL ...                  | 42.0            | 65    |                                                                                                         |

3. ACCURACY WITH RAPIDITY.—At moving Target (e)—A moveable 6' × 12' Target, at 800 yards Range, to be caused to move diagonally across the line of fire to a point 400 yards from the Gun at a trot. Number of hits to be noted. The lateral distance to be travelled to be about 400 yards.

Shoeburyness, 3rd February 1881.

| GUN.                     | Series. | Time of cross-<br>ing. | Number of<br>rounds fired. | Number of<br>Hits obtained. | REMARKS.                                                                                                                                           |
|--------------------------|---------|------------------------|----------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |         | <i>Min. Secs.</i>      |                            |                             |                                                                                                                                                    |
| 2-barrel Gardener ...    | 1       | 2 5                    | 149                        | 5                           | Gun laid by Mr. Gardener, fired and fed by Assistant.                                                                                              |
| 5-barrel Gardener ...    | 2       | Not observed ..        | 245                        | 14                          | Fired in series of three volleys at a time, and relaid. Target at first portion of distance was nearly end on, and presented a very small surface. |
| 10-barrel Nordenfelt ... | 8       | Do. ...                | 310                        | 27                          | Mr. Nordenfelt fired; his brother laid, and Assistant to feed.                                                                                     |
| 5 Do. „ ...              | 6       | 1 24                   | 178                        | 11                          |                                                                                                                                                    |
| <i>Carbines.</i>         |         |                        |                            |                             |                                                                                                                                                    |
| 9 rounds, Captain Adams  | 11      | 1 50                   | 40                         | 5                           |                                                                                                                                                    |
| 9 „ Colonel Close...     |         |                        |                            |                             |                                                                                                                                                    |
| 10 „ Lieut. Goold        |         |                        |                            |                             |                                                                                                                                                    |
| 12 „ Adams               |         |                        |                            |                             |                                                                                                                                                    |
| 12 „ Captain Callaghan   |         |                        |                            |                             |                                                                                                                                                    |

#### 4.—Velocity Trials.

Screens 120 feet apart; 1st Screen 110 feet from Gun.

Shoeburyness, 27th January 1881.

| Gun.                   | Barrel. | VELOCITY.       |                | REMARKS. |
|------------------------|---------|-----------------|----------------|----------|
|                        |         | Observed.       | Muzzle.        |          |
|                        |         | <i>Feet per</i> | <i>Second.</i> |          |
| 2-barrel Gardener Mean | ...     | 1,289           | 1,385          |          |
| 5 „ Do. Mean           | ...     | 1,270           | 1,364          |          |
| 10 „ Nordenfelt Mean   | ...     | 1,311           | 1,409          |          |
| 5 „ Do. Mean           | ...     | 1,274           | 1,368          |          |

5 a. EXPOSURE TRIALS.—Guns to be wiped clean and left uncovered for a week in the open. Before firing, half a minute allowed for cleaning, with such material as would be found with the carriage. Continuous firing for half a minute to be then carried out.

Shoeburyness, 17th February 1881.

| GUN.                               | How cleaned.                                                                                            | Time taken to clean. | Number of rounds fired in half a minute. | REMARKS.                                                                                                                                     |
|------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                    |                                                                                                         | <i>Secs.</i>         |                                          |                                                                                                                                              |
| 2-barrel Gardener                  | Mr. Gardener and one Assistant; Oiled chambers and action generally; afterwards working handle rapidly. | 30                   | 209                                      | Mr. Gardener and two Assistants. No hitch, except that Assistant missed feed groove & lost half case full. This led to a very slight pause.  |
| 5-barrel Gardener                  | Similar treatment ...                                                                                   | 28                   | 405                                      | Mr. Gardener and two Assistants. Two misses, no hitches.                                                                                     |
| 10-barrel Nordenfelt               | Mr. Nordenfelt and one Assistant; oiled chamber and action very freely.                                 | 20                   | ...                                      | Jam after 18 Seconds; 18 Volleys. This arose from not getting the top hopper in proper position.                                             |
| Do. (repeat)                       | .....                                                                                                   | ...                  | 399                                      | At 26 Seconds, one Cartridge jumped up, cap-sized and jammed. When pulled out of one groove by Assistant, it fell wrong way up into another. |
| 5-barrel Nordenfelt                | Mr. Nordenfelt and one Assistant oiled.                                                                 | 12                   | 330                                      | No hitches.                                                                                                                                  |
| 10-barrel (direct action) Gatling. | Mr. Accles & two Assistants, with oil cans, oiled action axles of barrels, &c.                          | 25                   | 29                                       | Jam at four seconds. One cartridge rim cut through by extractor. One miss. Another very much cut.                                            |
| Do (repeat)                        | .....                                                                                                   | ...                  | 226                                      | Hitch at 20 seconds; over-come without opening action.                                                                                       |



5 b.—EXPOSURE TRIALS.—Each Gun to be fired for half a minute under an oscillating over-head sieve filled with dry silver sand.

Shoeburyness, 21st February 1881.

| GUN.                    | Rounds Fired. | Missfires. | REMARKS.                                                                                                                                                                                                                               |
|-------------------------|---------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2-barrel Gardener ...   | 91            | ...        | Jam, and stopped at 12 seconds, caused evidently by sand under rim of cartridge. When cartridge was taken out the action was quite free.                                                                                               |
| 5-barrel Gardener ...   | 168           | 2          | Jammed and stopped at 15 seconds. Sand fell very poorly, but one large piece of grit getting into action caused the jam.                                                                                                               |
| 10-barrel Nordenfelt... | 139           | ...        | Jam, and stopped at 9 seconds; sand under the rims of two cartridges, which no doubt caused the jam.<br>A large quantity of sand fell on this Gun. A large number of cartridges passed through action, in trying to over-come the jam. |
| 5-barrel Nordenfelt...  | Not counted.  | ...        | Jam, and stopped at 12 seconds, No. 1 barrel failed to extract rim of cartridge cut through by extractor; quantity of sand found under it.<br>Action very stiff to work after trial.                                                   |

#### ENDURANCE TEST.

Guns dragged twice through ditch in marsh; very full of mud. Bucket of water, brush, and screw driver allowed for cleaning.

Shoeburyness, 21st February 1881.

| GUN.                   | Time taken to open fire. |       | Number of rounds fired. | Time of firing. | REMARKS.                                                                                                                 |
|------------------------|--------------------------|-------|-------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------|
|                        | Min.                     | Secs. |                         | Secs.           |                                                                                                                          |
| 2-barrel Gardener ...  | 3                        | 52    | 60                      | 49              | Mr. Gardener directing, his Assistants and two men cleaning; plentiful watering.                                         |
| 5-barrel Gardener ...  | 4                        | 21    | 150                     | 13              | 55 Cartridges put through unfired.                                                                                       |
|                        |                          |       | 55                      | 20              | Emptied water out of action; Mr. Gardener explained that it had deadened the force of the blow delivered by the striker. |
|                        |                          |       |                         | 33              | After the water had been emptied out, the same 55 cartridges were fired in 20 seconds.                                   |
| 10-barrel Nordenfelt.. | 6                        | 20    | 300                     | 19              | Mr. Nordenfelt and three men working and cleaning.                                                                       |
| 5-barrel Nordenfelt..  | 3                        | 28    | 150                     | 12              | Do. do. do.                                                                                                              |

*Table A.*

| GUNS.                   | Total number<br>of rounds fired. | Total number<br>of rounds fired<br>per barrel. | Total number<br>of misfires. | Total number<br>of jams. | REMARKS.                                                                                                               |
|-------------------------|----------------------------------|------------------------------------------------|------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------|
| 2-barrel Gardener...    | 6,929                            | 3,464                                          | 5                            | *                        |                                                                                                                        |
| 5    „    „    ...      | 16,754                           | 3,751                                          | 85†                          | 24                       |                                                                                                                        |
| 10-barrel Nordenfelt... | 7,239                            | 724                                            | 3                            | 12                       | Fifty-seven cartridges<br>dropped through unfired,<br>owing to backing of crank<br>to avoid jams.                      |
| 5    „    „    ...      | 7,439                            | 1,488                                          | 9                            | 21                       | Three hundred and<br>seventy-three cartridges<br>dropped out unfired, ow-<br>ing to backing of crank to<br>avoid jams. |

\* Jams in sand test not included with any of the guns.

† Due to weakness of springs.

*Table B.*

Relative Rapidity of the Machine Guns during the firing for half a minute, 1 *a* of Programme .

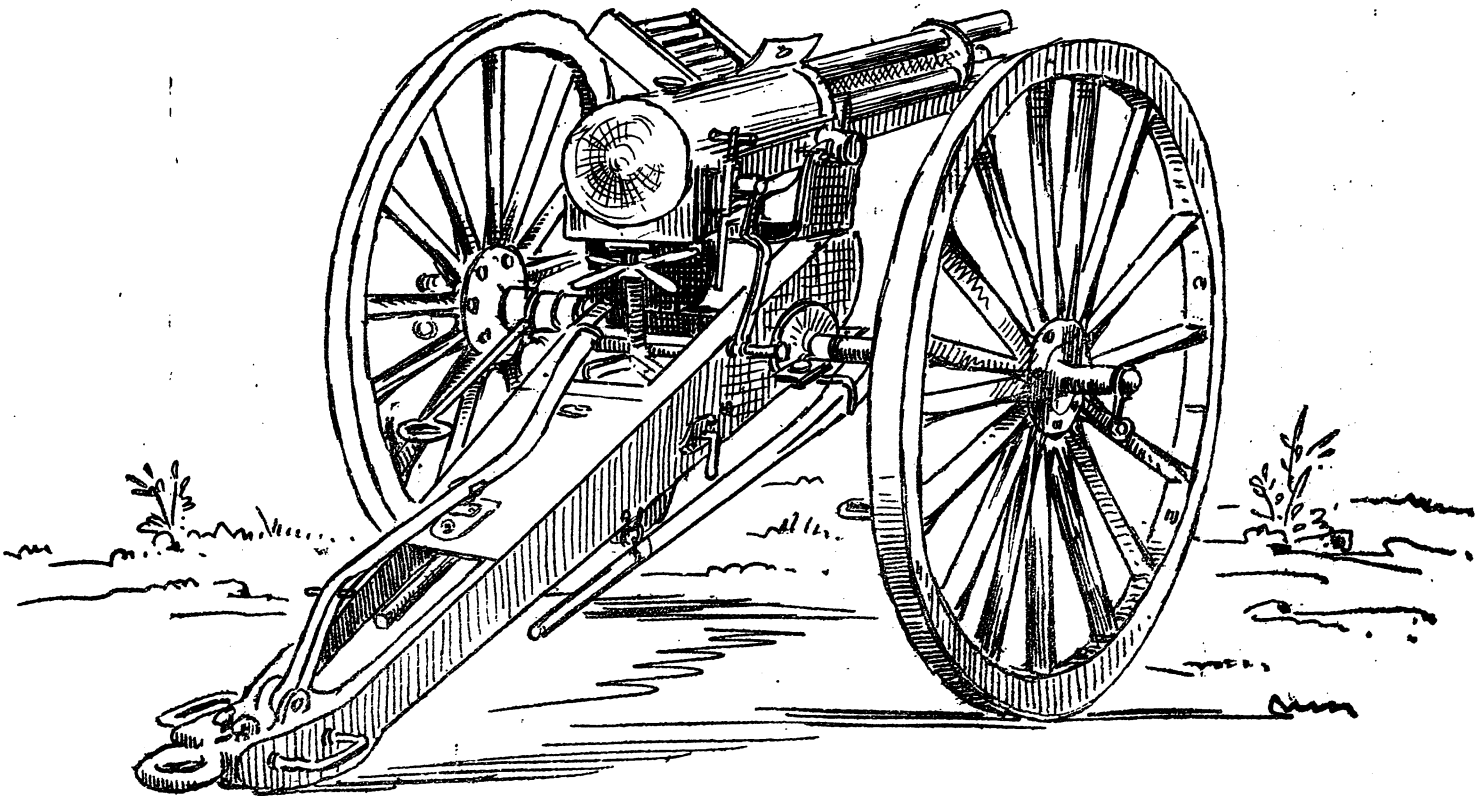
| GUNS.                 | Time.           | Rounds fired. | Rounds fired per barrel. | Rounds fired 10 lb. per weight of guns.* |
|-----------------------|-----------------|---------------|--------------------------|------------------------------------------|
|                       | <i>Seconds.</i> |               |                          |                                          |
| 2-barrel, Gardener... | 30              | 236           | 118                      | 27.3                                     |
| 5 „ „ ...             | 30              | 330           | 66                       | 10.3                                     |
| 10 „ Nordenfelt ...   | 30              | 430           | 43                       | 15.4                                     |
| 5 „ „ ...             | 30              | 310           | 62                       | 20.6                                     |

\* This column shows the relative rapidity of the different guns for equal weights, taking 10 lb. as the unit.

## MACHINE GUNS.

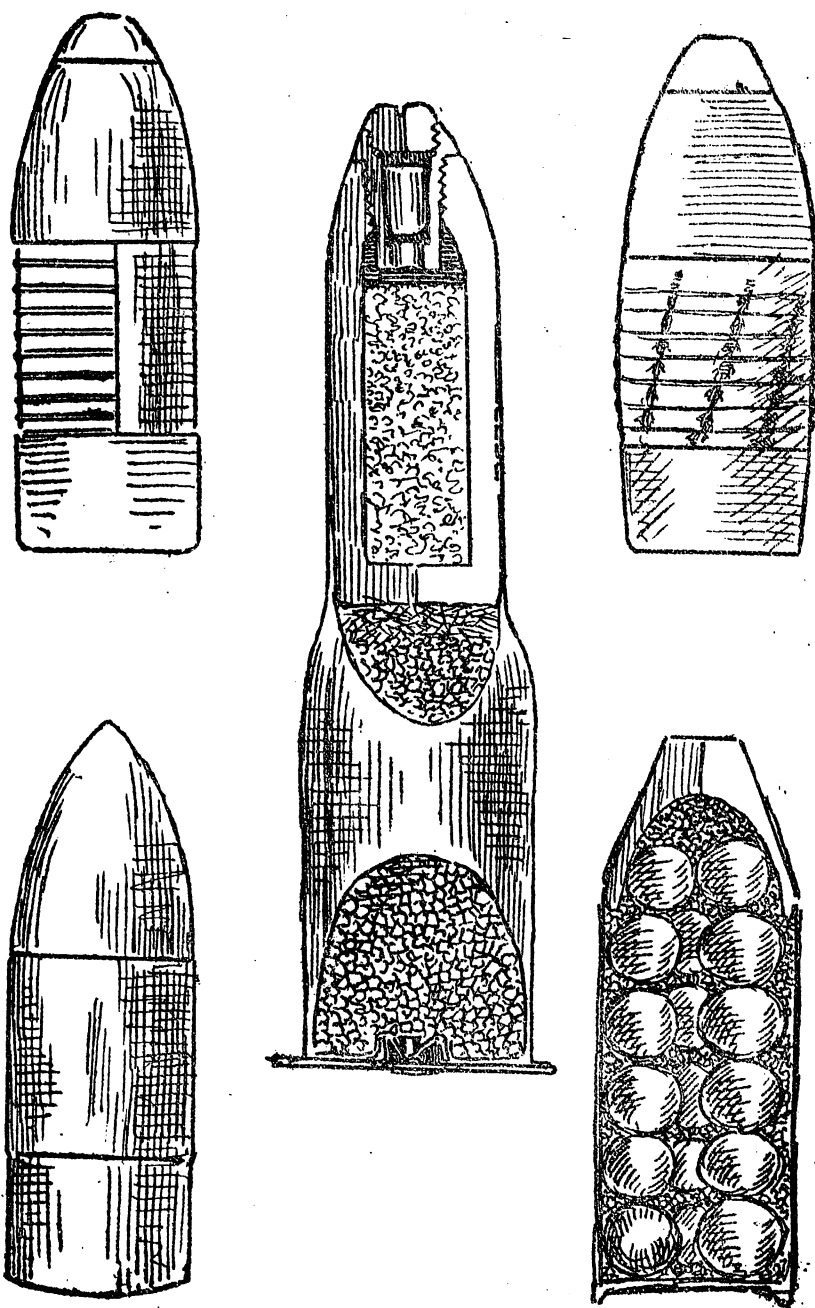
### *Weight of Guns*

| GUN.                     | Weight, exclusive of Feeder.      | Feeder.     | Length of Barrel. |
|--------------------------|-----------------------------------|-------------|-------------------|
|                          | <i>Cwts.-qrs.-lbs.</i>            | <i>lbs.</i> |                   |
| 2-barrel Gardener ... .. | 0   3   17                        | 6           | 30 inches.        |
| 5 „ „ ... ..             | 2   2   22                        | 24          | 30 „              |
| 10 „ Nordenfelt ... ..   | 2   1   10<br>(including feeder.) | ...         | 32½ „             |
| 5 „ „ ... ..             | 1   1   3                         | 6½          | 26½ „             |



*Drawn from the original Photograph by Lieutenant  
C. H. Manners-Smith, 3rd Sikh Infantry, and Photo-zinco-  
graphed in the Intelligence Branch, Quarter Master  
General's Department in India.*





*Drawn from the original Photograph by Lieutenant  
C. H. Manners-Smith, 3rd Sikh Infantry, and Photo-zinco-  
graphed in the Intelligence Branch, Quarter Master  
General's Department in India.*



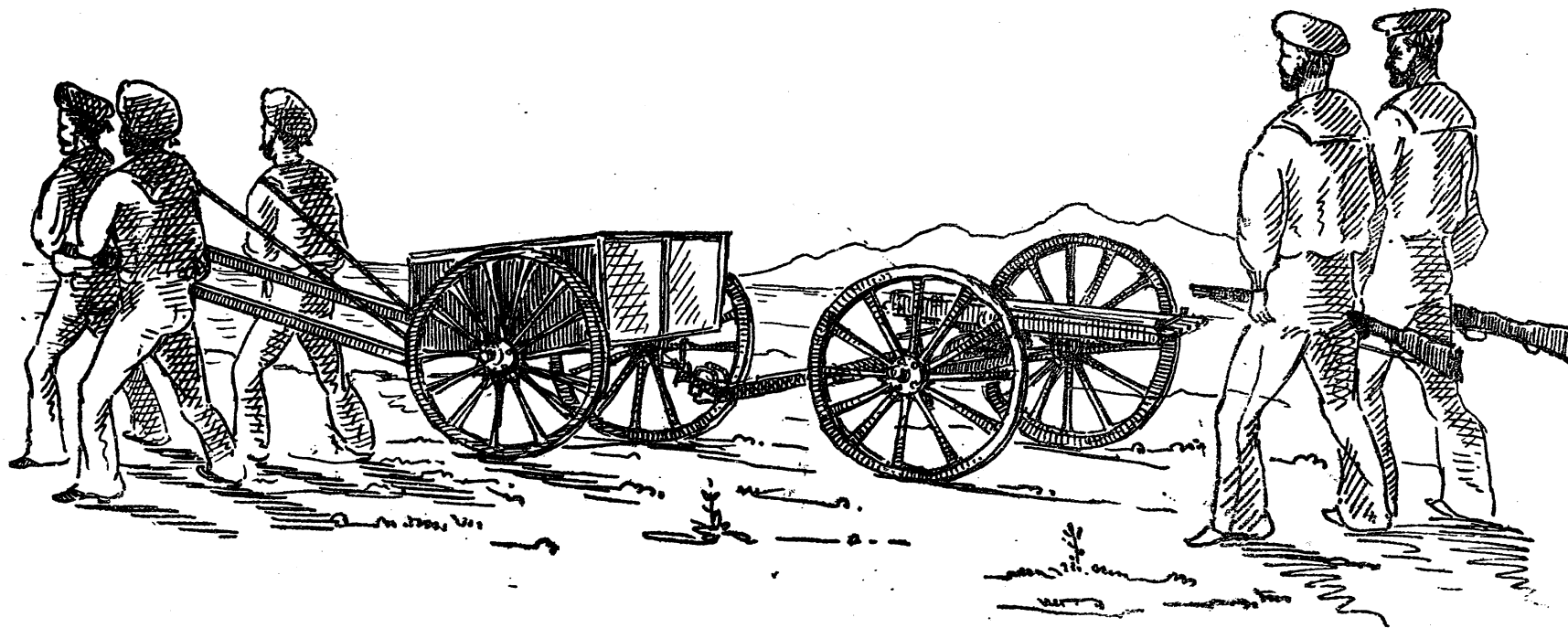




*Drawn from the original Photograph by Lieutenant  
C. H. Manners-Smith, 3rd Sikh Infantry, and Photo-zinco-  
graphed in the Intelligence Branch, Quarter Master  
General's Department in India.*



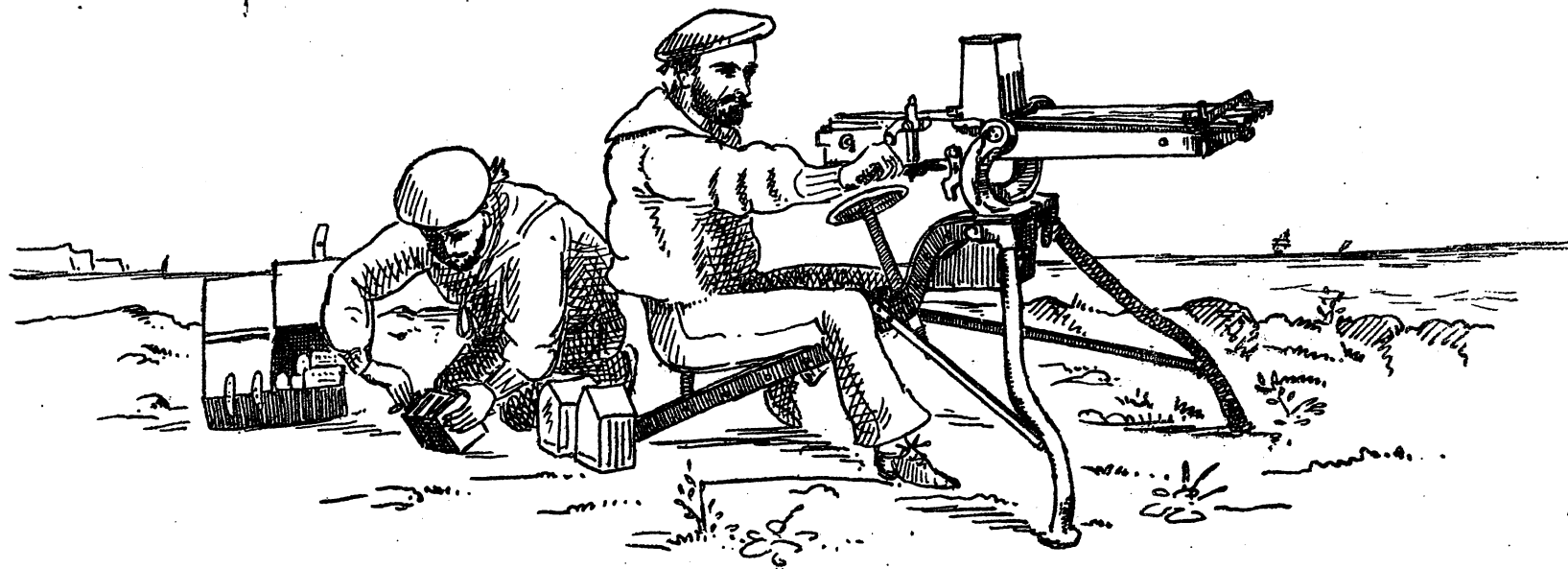




*Drawn from the original Photograph by Lieutenant  
C. H. Manners-Smith, 3rd Sikh Infantry and Photo-zinco-  
graphed in the Intelligence Branch, Quarter Master  
General's Department in India.*

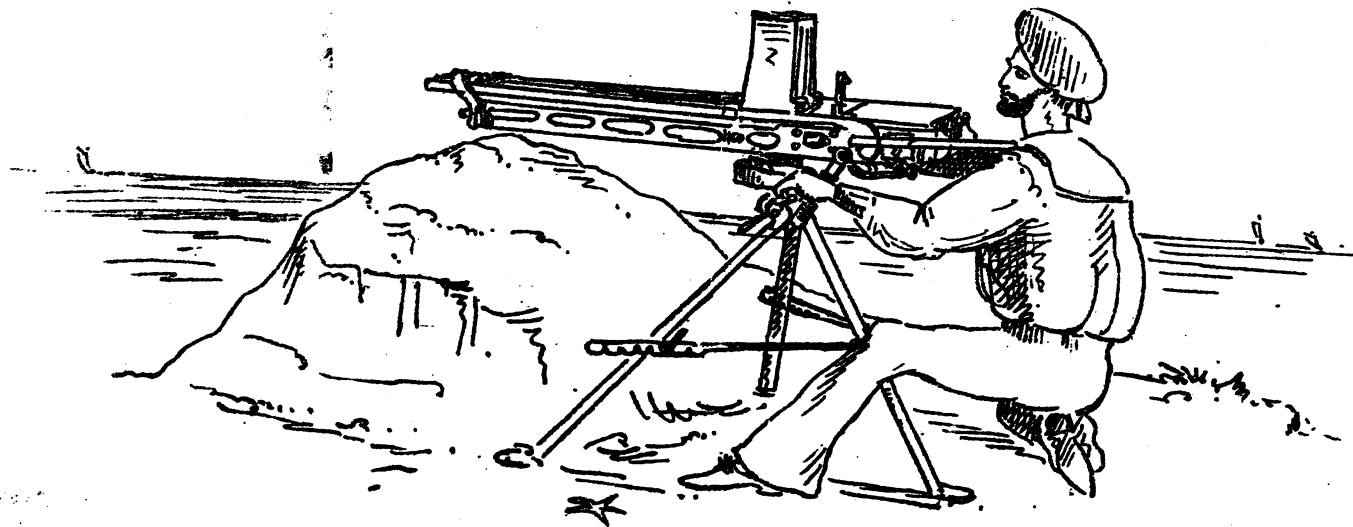






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C. H. Manners-Smith, 3rd Sikh Infantry, and Photo-zinco-  
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General's Department in India.*

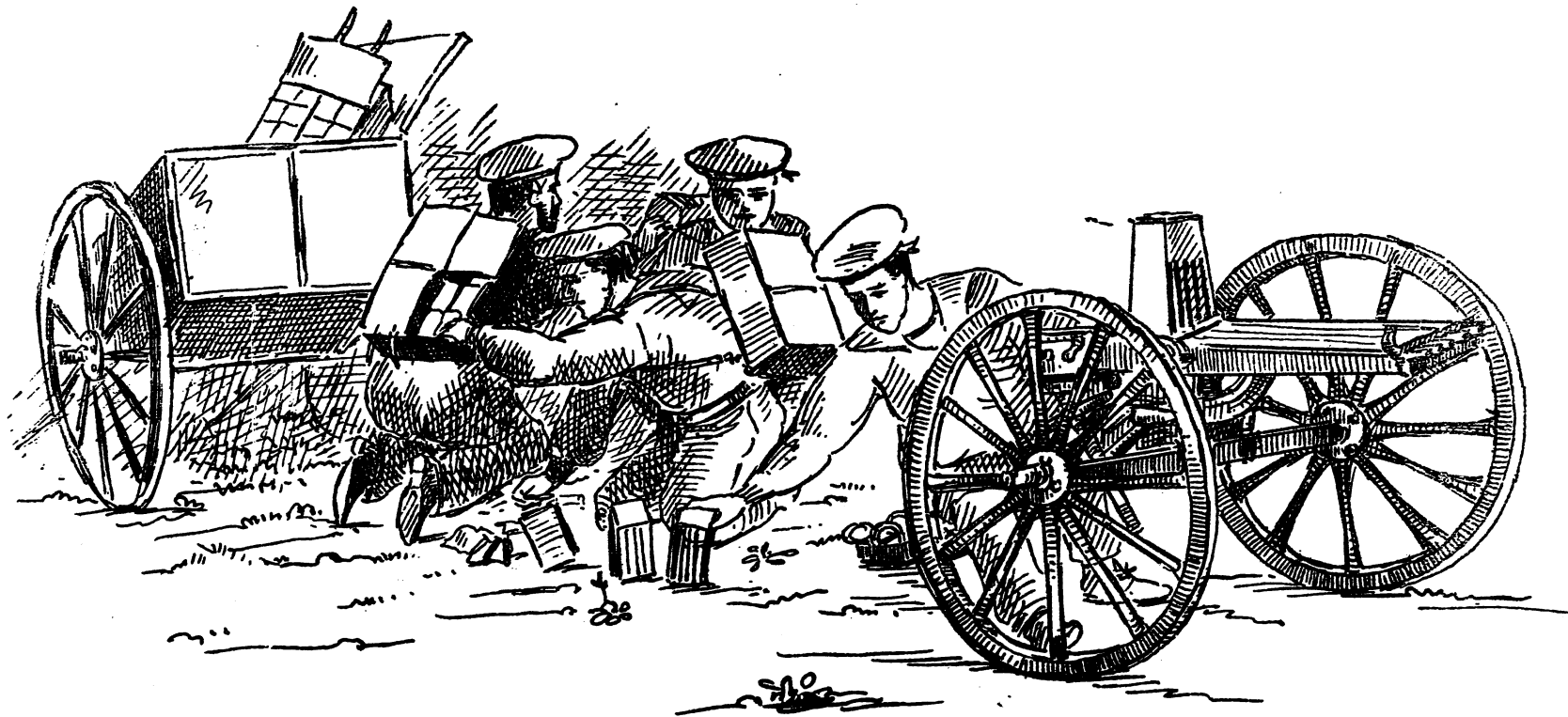




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General's Department in India.*







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C. H. Manners-Smith, 3rd Sikh Infantry and Photo-zinco-  
graphed in the Intelligence Branch, Quarter Master  
General's Department in India.*





# GARDNER GUN.



*Gun portable rest  
and 1000 cartridges  
(weight 200lbs)*

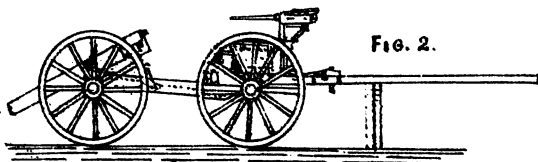


FIG. 2.

*Gun bolted to Limber (weight 200lbs)*

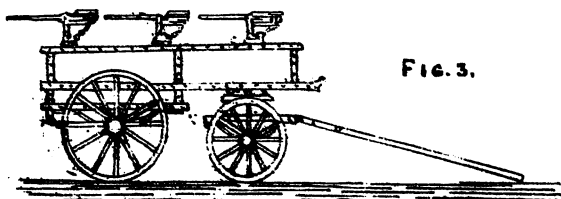
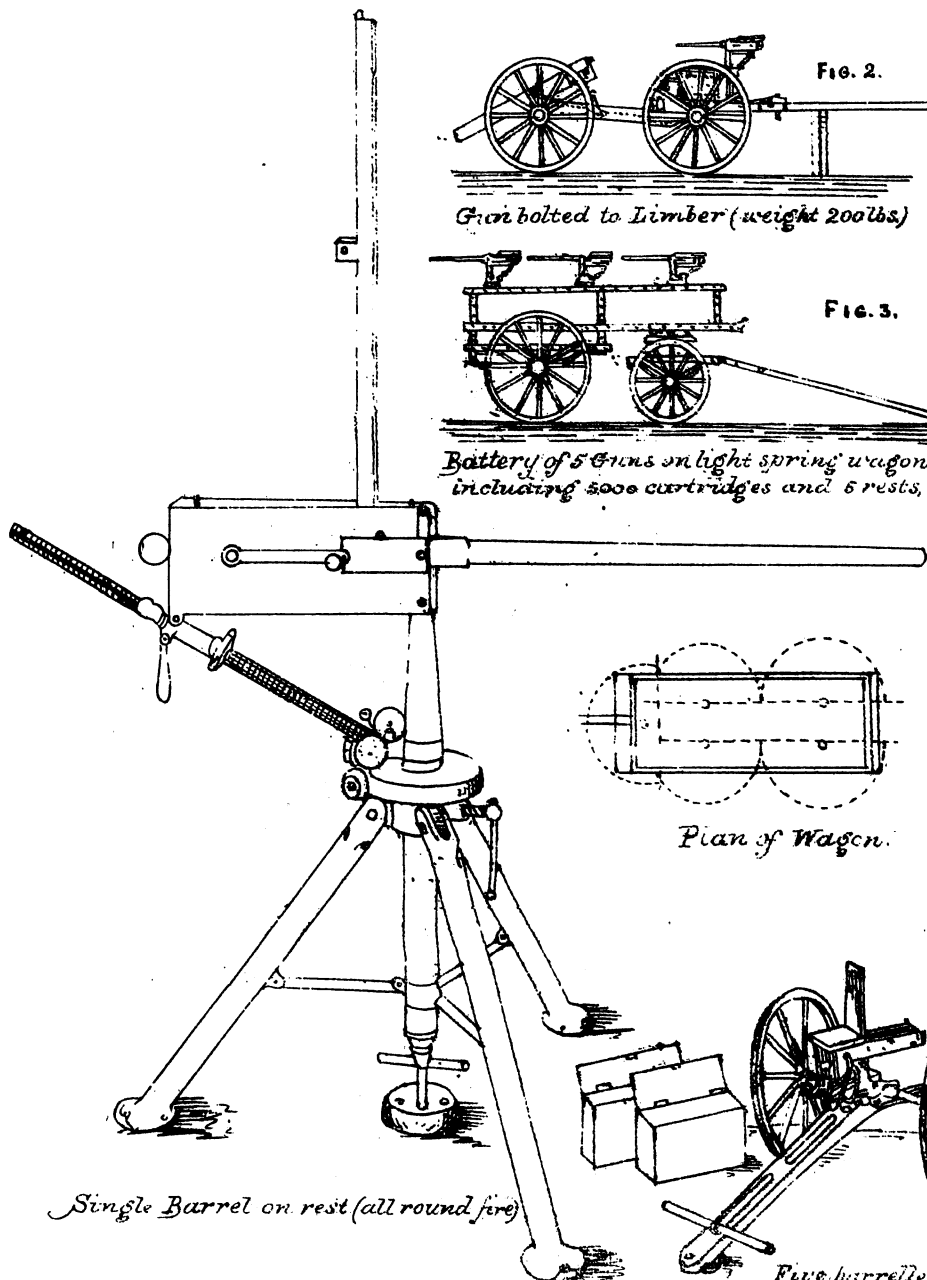


FIG. 3.

*Battery of 5 Guns on light spring wagon (weight  
including 5000 cartridges and 5 rests, 2000 lbs.)*



*Plan of Wagon.*

*Single Barrel on rest (all round fire)*

*Five barrelled Gun  
(closed) and Limber Boxes.*



## VII.

### BENGAL CAVALRY IN EGYPT,

BY  
CAPTAIN C. GORDON,  
*6th Bengal Cavalry.*

---

A Troop of the 6th Bengal Cavalry and one of the 13th Bengal Lancers disembarked at Suez on the 21st and 23rd August 1882, respectively.

They encamped north of the Hospital, about 2 miles south-east of Bir Suez. ("Bir," Arabic for well.)

The rest of the Indian Cavalry disembarked at Ismailia.

*23rd August. Reconnaissance to Fort Ajrood.*

On the 23rd August a party of ten sabres, with two British Officers reconnoitred towards Fort Ajrood: distance 11 miles.

Fresh water was found in the well at Bir Suez, distance 2 miles; Water ten feet from the surface. Ajrood is a square fort, sides seventy yards long; walls of masonry (with towers at the angles), six feet thick at the bottom, but only one foot thick from banquette to the top of the wall. The fort is commanded by a ridge, four hundred yards to the north.

The position had been occupied by a force of two squadrons of Cavalry, four companies Infantry, and two guns: they abandoned it the night following the defeat at Chalouf. This information regarding the strength was ascertained from an Arabic document picked up on the ground.

One hundred and fifty yards west of the Fort is a Persian well, in walled enclosure; but the wheel being out of order, and water three hundred feet from the surface, it is at present useless as a watering place for troops. The water supply of the force above referred to was carried in casks, and there were no traces of the well having been used at all.

*24th August.*

The two troops received extra mule carriage, and drew four days provisions.

*25th August.*

Marched to Chalouf, distance eleven miles, carrying four days supplies. The camp was pitched on the scene of the late action: the Egyptians had left tents, arms, knapsacks and water bottles, besides large quantities of ammunition, on the ground. They lost over a hundred and sixty men here, while our force only lost two, who were knocked over by a hawser and drowned in the canal when crossing in a boat.

*26th August.*

Marched to camp "Bridge and Lock," six miles beyond Gennefeh and seventeen from Chalouf.

*27th August.*

Marched to Ismailia, twentyseven miles, passing through Nifiche at 4 P.M.

The remainder of the Indian Cavalry was disembarking here, except one Squadron 6th Bengal Cavalry, which did not join the Brigade until 12th September, the evening before the battle of Tel-el-Kebir.

*28th August.*

The Brigade stood fast.

*29th August.*

Marched to Kassassin, about 23 miles, and encamped in rear of General Graham's Brigade; passing the Duke of Connaught's Brigade at Tel-el-Mahuta and the Heavy Cavalry at Maksama. The latter were pulling themselves together after the Cavalry charge, which took place on the evening of 27th instant.

*30th August to 5th September.*

General Wilkinson made repeated reconnaissances, both north and south of the Canal. The Bengal Cavalry invariably furnished the picquets by day and the Heavy Cavalry at night.

*6th September.*

A troop of the 6th formed the outlying picquet this day. Two Squadrons of the enemy's cavalry reconnoitred towards our picquet and commenced firing at about eight hundred yards; they were driven off with a loss of two men and a horse.

During the pursuit, Infantry was seen formed up in their rear; our picquet therefore retired, at a walk in extended order, under the fire of their Remintons.

Meanwhile General Wilkinson turned out the Brigade and dispersed the enemy. Lieutenant Holland, 19th Hussars, being shot through the shoulder.

*9th September.*

Puzzled by our inactivity, Arabi determined on taking the initiative; and a concerted plan was arranged to surprise our camp on the 9th. A contingent of ten guns, three squadrons, and two thousand Infantry was called up from Salihe, a town about seventeen miles N. W. of Kassassin.

The Egyptians bivouaced on 8th September about five miles from Kassassin, in order of battle, meaning to rush the camp next morning.

A troop of the 13th Bengal Lancers under Lieutenant Colonel Pennington was on picquet duty this day; and shortly after dawn the

enemy's cavalry threatened him. At first it was thought to be merely the usual skirmish, such as occurred on 6th instant, and almost daily after that date: but emboldened by strength they awaited Colonel Pennington's attack, who killed five of the enemy capturing all their horses in the *melée*; the 13th losing one man killed and three horses wounded.

Two sowars of the 13th Bengal Lancers were awarded the third class Order of Merit for gallantry on this occasion.

As soon as the news arrived in camp that the enemy were advancing in force, the Cavalry Division turned out (somewhat gradually, it must be confessed, for the attack was unexpected).

Trotting quickly to the scene of action, the Bengal Cavalry took ground to the right in column of troops with the whole of Arabi's army visible in line on their left flank and about a mile off. The Egyptian Artillery opened fire as we appeared on the sky line; their shells being very well directed. The first went over the heads of General Wilkinson's Staff and burst immediately in front of a troop of the 13th, but did no damage. Another knocked over two horses of the 2nd Bengal Cavalry, while a Battery of ours coming into action on the left of the Cavalry had two gunners wounded.

About this time eight Squadrons of hostile cavalry appeared on our left, we being still in column of Troops, and it looked as if they meant coming on: but on our wheeling into line and forming *échelon* of regiments from the left, they thought better of it, and retired.

A general advance was now made and the Egyptians retired behind their earthworks, and commenced a game of long bowls.

We advanced to the position they had held during the night which could be easily traced by the supplies and ammunition strewn about.

The Household Cavalry with a battery of Horse Artillery had also been briskly engaged on our right (and a very long trot it must have been to get there). Coming across the contingent from Saliheh which formed Arabi's left, they drove them back whence they came, capturing a gun in position on a sand hill. Eleven dead were counted round this gun, supposed to have been killed by one shell.

As further advance would have interfered with the plans of our Head Quarters, the troops were ordered back to camp Kassassin, having been under Artillery fire from 7. A.M. till noon. Total casualties sixty.

Mahmoud Sammy, the General in command, was wounded early in the day, which may partly account for the total collapse of Arabi's "surprise."

#### BATTLE OF TEL-EL-KEBIR, 13TH SEPTEMBER 1882.

At noon on 12th September 1882, orders were issued for the Artillery and Infantry at Kassassin to march towards Tel-el-Kebir that evening and bivouac near the enemy's position, which was to be carried at the point of the bayonet at daybreak on 13th instant.

7-1 Mountain Battery.  
 72nd Highlanders.  
 7th }  
 20th } Native Infantry.  
 29th }  
 One Company Sappers.  
 One Squadron 6th B.C.

The Indian contingent were to march at the same time, along the south bank of the Canal; while the Cavalry Division were ordered to gain the left flank of the enemy, and cut off his retreat when the Infantry attack had succeeded.

In accordance with the above the Cavalry Division paraded at 1 A. M. on the 13th.

The baggage had been previously packed and arrangements were made, by leaving surplus baggage at Kassassin, to mount every follower.

At 1.15 A. M. the Division, accompanied by G. R. and N. A. Royal Horse Artillery, crossed the Railway, and proceeded in a northerly direction in column of troops. The direction was kept by the stars, and together with the pace, so calculated as to bring us about a mile from the enemy's position by daybreak.

The greatest care was taken not to alarm the enemy and thereby frustrate the plans made for the Infantry attack.

At 3 A. M. the Division wheeled into line of squadron columns to the left, and halted. The Light Brigade on the right, guns in centre and Heavies on the left of the line.

Shortly after four o'clock, two guns were heard towards the right of the enemy's position followed immediately by the rattle of musketry. This was thought to be our Infantry, but in reality it was the enemy opposing our attack by bayonet.

The troops mounted at once and started off at a trot entering the enemy's position just at dawn, between his front line of entrenchments and an isolated work on his extreme left—vide sketch.

Thousands of Infantry, a few Cavalry and Artillerymen, without their guns, were now seen abandoning the position, and in full retreat towards Zag-a-zig, or making for the Cairo road.

At first, and as long as resistance was offered, they were cut down and speared by our men; but they soon threw down their arms and cried for quarter: and General Lowe, commanding the Division, sent the order to stop killing them. In fact before this order came, the sowars had asked their officers whether they were to cut down the fugitives or not; and on being told not to, they opened out the ranks, and let them through; striking at them playfully with the flat of their swords.

The advance, in échelon of regiments from the left, across the rear of the position, continued at a fast pace, until the 13th Bengal Lancers arriving at the extreme right, were checked by musketry fire from a train steaming out of Tel-el-Kebir Station, followed close behind by a second: these two escaped; but a third was stopped and captured, a camel having got across the line and fouled the engine.

The halt was now sounded, as further advance would have brought the cavalry under our own Artillery and Infantry fire.

The position of our Infantry formed up for action is roughly shown in accompanying sketch; and their brilliant and gallant attack has been fully described before by eye witnesses.

Sir Garnet Wolseley's force, after carrying the position north of the canal, joined hands with the Indian contingent on the drawbridge at Tel-el-Kebir, General Macpherson having overcome all opposition met with, during his advance along the south bank.

To return to the Cavalry—as soon as our Artillery and Infantry fire ceased, the Light Brigade were ordered off towards Belbeis; 6th Bengal Cavalry forming the advanced guard, followed by a company of mounted Infantry, the 13th Bengal Lancers, and 2nd Bengal Cavalry.

First, the lock at Abassah was seized about four miles from Tel-el-Kebir and thirteen from camp Kussassin. The horses were watered here, and then a fresh start was made along the Cairo road towards Belbeis.

Hundreds of fugitives were passed, running along both banks, very much exhausted and fatigued, and sticking to the Canal for water. Those close to hand were disarmed, but no delay was made to effect this; Arabi's army was utterly routed and not likely to rally again.

About two miles from Belbeis, a formed-up body of Infantry was overtaken by the squadron of the 6th Bengal Cavalry. They were on the opposite bank of the Canal, and on being called upon to surrender, replied by a volley at eighty yards distance without touching a man or a horse! The Squadron got under cover of the Canal bank with considerable celerity, and opened fire with their carbines, inflicting considerable loss on the enemy, and the mounted Infantry, with the 13th Bengal Lancers, now joining the scrimmage, they were completely dispersed leaving about twenty dead on the field.

Belbeis, which surrendered without opposition, was reached at 11. 45 A. M. Arabi Pasha had been there twenty minutes before, and left for Cairo by train: it was ascertained that the formed-up body above referred to had been given special orders to delay our advance, and thereby facilitate his escape.

The Heavy Brigade arrived at Belbeis in the course of the afternoon: the total distance covered by the division throughout the day being thirty two miles. Plenty of green forage was obtained here, where the troops bivouaced for the night.

After joining hands with Sir G. Wolseley, General Macpherson was ordered to go on and seize Zag-a-zig: this the squadron of the 6th Bengal Cavalry did in the afternoon of 13th instant, commanded by Major Jennings, and accompanied by Lieutenant Burne-Murdoch, Royal Engineers. These two Officers, with a handful of Sowars, captured three trains; and the latter officer himself took one of them down the line and brought up some of our Infantry therein to Zag-a-zig.

At 5 A. M. on the morning of 14th instant, General Lowe, with the 4th Dragoon Guards and 2nd and 13th Bengal Cavalry, proceeded towards Cairo: leaving the canal bank and crossing the desert, they arrived at Abassich (the Artillery and Cavalry Barracks at Cairo), about 6. P. M.; and Arabi surrendered to General Lowe the same evening.



Meanwhile Brigadier General Wilkinson, with a company of mounted Infantry, one Squadron 6th Bengal Cavalry, and a troop of the 13th Bengal Lancers, having started from Belbeis at 7. A.M., kept to the canal bank, halting at Syracus Lock for a short time to feed; and reached the bridge one mile from Cairo Railway Station at 7 P.M.

Estimated distance\* from Belbeis thirty two miles. The Cavalry Division having thus covered sixty four miles in two days and taken part in the battle of Tel-el-Kebir on the first.

No campaign is without useful practical lessons; and among other things the successful employment of Cavalry *Skirmishers* (not scouts) by the Egyptians during reconnaissances was noticeable. The country to the north of the Freshwater Canal was an undulating desert, and although the position selected for the outposts possessed the advantage of a long range of view, the undulations afforded intermediate cover and offered advantages to troops advancing from Tel-el-Kebir.

The high ground was covered with a hard crust making it good "going" for Cavalry, but in the valleys was heavy holding sand: not a tree or any shade to be seen (towards the front), as far as the eye could reach; and in addition to the dazzling rays of a September sun, a strong wind blew up the sand and made the work—requiring such vigilance and attention, as outpost duty does—most trying. Such is a brief description of the country intervening between the two forces; and one smart Egyptian officer gave our outposts a deal of trouble by his energetic reconnaissances of our position.

There was a mound about four miles from Kassassin, too distant, among other reasons, for us to occupy, which commanded our camp. The above officer sending out clouds of cavalry skirmishers advanced with some supporting Infantry, and himself occupied this mound: from whence he inspected Kassassin through his glasses at his leisure. These skirmishers advanced rapidly in a long line, acting in groups of three, and opened fire (mounted) at our picquets standing in the open, from about a thousand yards distance.

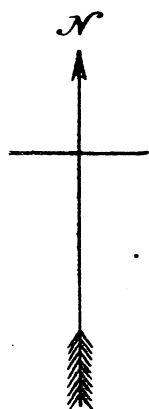
Their shooting was erratic certainly, but it necessitated extended order on our part. Dismounted fire was not much use against them being single vedettes on the move; and if our piquet attacked in a formed body, they rapidly dispersed on their hardy little Syrian horses and sought the protection of their Infantry in rear; only to return again, like bees, as soon as we had re-occupied our ground.

So harassing were these skirmishers that a squadron in camp was always held in readiness to turn out and assist our weak piquet.

Notwithstanding our efforts to the contrary, however, I think, (and if this meets the eye of any British officers who were on day picquet duty at Kassassin, they will probably agree with me), that the Egyptian officer in blue, on his grey Arab, with his long telescope, knew a good deal more about camp Kassassin than his enemy did about Tel-el-Kebir.

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\*The whole march from Suez to Kassassin, and thence to Cairo was through heavy sand, and therefore more severe than the distances (between Stages) would lead one to suppose.



# SKETCH OF "TEL EL KEBIR"

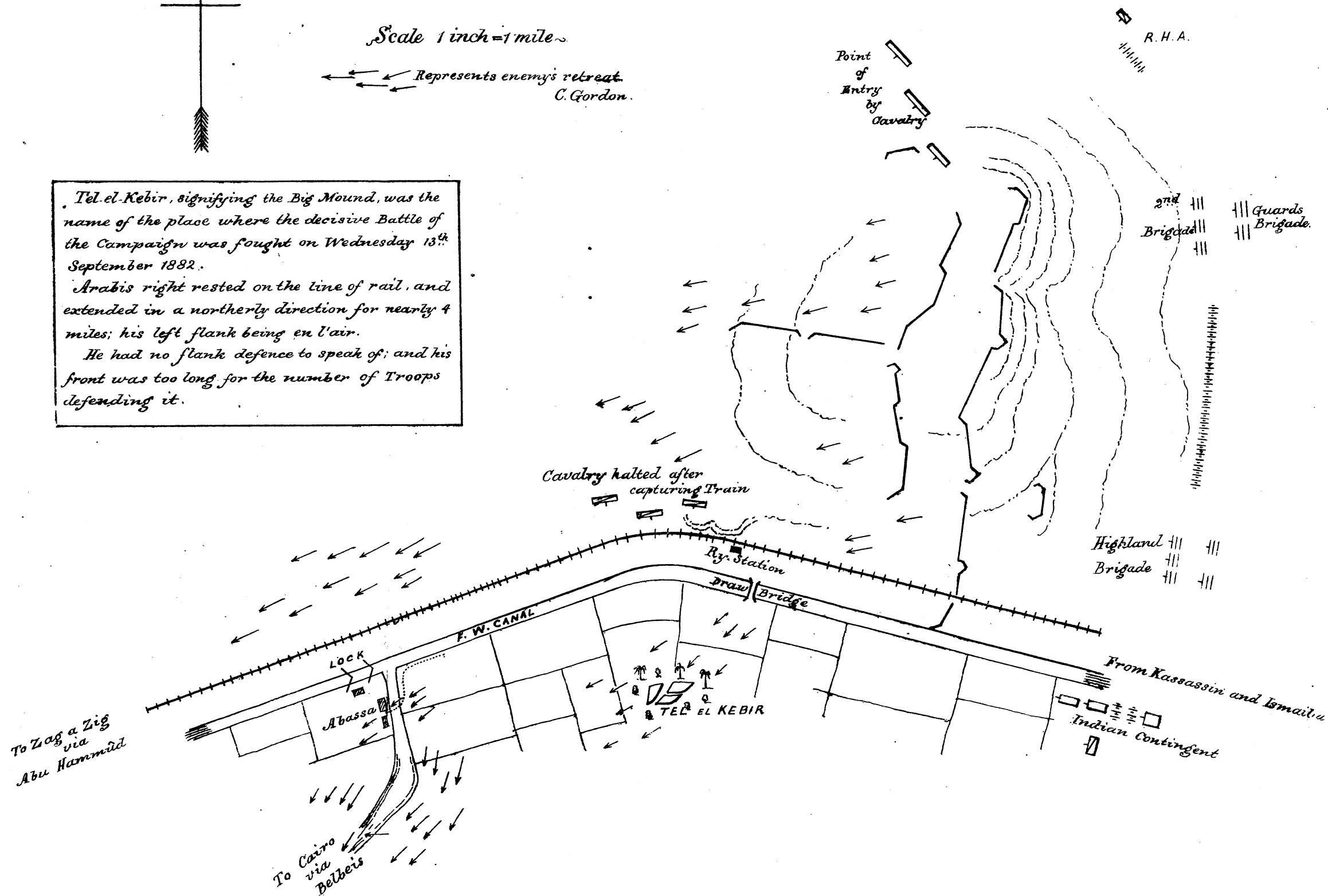
Scale 1 inch = 1 mile

← ← ← Represents enemy's retreat.  
C. Gordon.

Tel el-Kebir, signifying the Big Mound, was the name of the place where the decisive Battle of the Campaign was fought on Wednesday 13<sup>th</sup> September 1882.

Arabis right rested on the line of rail, and extended in a northerly direction for nearly 4 miles; his left flank being en l'air.

He had no flank defence to speak of; and his front was too long for the number of Troops defending it.





## VIII.

### NOTES ON MILITARY PHOTOGRAPHY

BY

LIEUTENANT O. E. WHEELER,

*2nd Leicestershire Regiment, Attaché, Intelligence Branch, Quarter  
Master General's Department in India.*

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Arguments are hardly needed to prove how useful photography would be, if it could be generally and readily applied to the requirements of the Art of War. The rapidity with which a photograph can be secured, its extreme truthfulness and delicacy of detail, and the ease with which it can be almost indefinitely multiplied, are intrinsic advantages which place photography, so far as military purposes are concerned, a long way ahead of ordinary draughtsmanship. Moreover photography and draughtsmanship can always be easily, sometimes most satisfactorily combined: a general view of a fort, for instance, may be secured with the camera, the details being supplied by the pencil; or, *vice versa*, a military sketch can be laid down by a draughtsman while his companion is photographing the various details likely to prove of military interest.

But while the *uses* of photography scarcely need exposition, its partisans have not always been able to say as much regarding the *means* of applying it to military purposes. For many years, until the introduction of what are known as *dry-plate* processes, photography laboured under several objections which greatly hampered its utility from a military point of view. For instance, when a photographer went out to the Crimea with the object of securing photographs illustrative of the war, he took with him no less than thirty-six large cases containing his apparatus and chemicals together with a van which has been described by an authority as "a kind of hybrid affair, between an ambulance and a bathing machine." Such *impedimenta* as these would, to say the least, be hardly adapted to the modern requirements of a field force, not to mention those of a flying column. Again, photography in former days not only argued a long and expensive education, but required considerable care in keeping the many delicate preparations used in order, and often considerable ingenuity in rectifying errors due rather to unforeseen accidents than to neglect. Thirdly, the process of photography which used commonly to be in vogue, was in its action so slow that it seldom admitted of the adequate reproduction of any but stationary objects. Lastly, the practice of photography with wet plates involved so large an initial outlay, if a really good and serviceable "kit" was required, that it could hardly commend itself except to a few whom enthusiasm or special opportunities drove to attempt what was then, only too truly, one of the "black Arts."

During the last few years, however, these objections have been, so to speak, categorically removed. The introduction of dry plate photography has not only placed a new power in the hands of the photographer, but it has brought down almost to a minimum the disadvantages under which he was formerly compelled to work. This will perhaps be better understood by my briefly setting down what may be termed the various "conveniences" of dry-plate photography.

(1). The apparatus for dry plate photography is simple, portable, and cheap. It consists of little more in fact, than a camera with a changing-box, or perhaps preferably a few double slides, a lens, a tripod, and a dish in which to develop. Its portability is such that the apparatus and plates for securing half-a-dozen negatives, cabinet size, during a reconnaissance, could easily be carried by an officer in addition to a revolver or other means of personal defence. It is cheap, in as much as a complete apparatus of the best possible kind, including one of the finest lenses procurable, and materials for printing as well as for the production of negatives, can be bought at home for sixteen or seventeen pounds, while a kit capable of producing really very good results indeed, could be purchased for ten or twelve.

(2). Dry plates can be bought ready made, of excellent quality and at such low prices, that, unless exceptional facilities are available, it is hardly worth while for an amateur to attempt to prepare his own. As an example of the cheapness of dry plates, I may mention that six dozen plates, cabinet size, by a well known maker can be obtained at home for twenty two shillings and sixpence. By buying the plates ready prepared, all the trouble that in the wet plate process arises from the use of collodion and the silver bath, is entirely obviated. All that is necessary is to transfer the plates from the original boxes in which the makers pack them, to the double slides of the camera. They are then ready for exposure in a moment, or in two or three years' time if necessary. Even the objection that used to exist against the ordinary commercial dry plate, namely that the gelatine emulsion with which it is coated, was liable during development in very hot climates to dissolve, has now disappeared. There are numbers of plates in the market that can be safely developed under most trying conditions of temperature even without the use of ice.

(3). The chemicals used in dry plate photography are few, and the preparations of them simple and not liable to rapid deterioration. They are, moreover, inexpensive, seeing that at a liberal computation six dozen cabinet plates could be developed and fixed for less than Rs. 5.

(4). Dry-plate photography by the gelatino-bromide method is much easier to learn than the wet collodion process. A fortnight's education ought to be enough to enable any one to work alone, and a little subsequent practice will soon make him a good operator. Practice is mainly necessary in judging the exposure, and determining when to stop development. A few failures in the former case, and a close adherence to given rules in the latter, will soon make a proficient out of a beginner.

(5). In the matter of exposure, dry plates are infinitely superior to wet. Apart from the convenience of not requiring even a dark tent, the gain in rapidity is enormous. Photographs of moving objects can be readily secured by a comparatively unpractised amateur upon a commercial gelatine dry plate, which could only have been taken by a wet collodion worker of wide experience and under the most favourable of conditions. Then again the latitude allowed in exposure is a great advantage. This is readily obtainable by modifying the strength of the developer, and is often of extreme use in saving an over or under exposed plate which, if wet collodion had been employed and a similar error of exposure made, would have been an utter failure.

(6). The convenience of being able to put off the development of the exposed plates for six months, if necessary, is very great. Even to be able to keep them until night-time is very useful, in precluding the necessity of a dark room. Exposed dry plates can be readily developed, for instance, at night even in the bed-room of a hotel, by simply shading a candle with a screen of ruby glass or paper; or the development of the whole batch of plates exposed during a long tour can be postponed until the return of the operator, when they can be developed at leisure, amid all the conveniences and appliances of a dark room.

(7). The advantages of the gelatine dry plate process would be worth comparatively little if the results were not of standard quality. But it is not only possible but easy to obtain as good results with gelatine plates as are obtainable with the wet collodion process in the most favourable circumstances. Gelatine negatives are, if anything, superior to wet collodion ones in their extreme delicacy of detail, while the surpassing sensitiveness of gelatino-bromide of silver enables it to perform photographic *tours de force* of which wet collodion is quite incapable.

The above remarks only apply to the production of negatives under ordinary conditions with an ordinary camera. But photography, especially as regards military purposes, has been still further perfected by the introduction of such contrivances as, for instance, the Academy camera sold by Marion & Co., of Soho Square. This ingenious little instrument may be described as a kind of photographic binocular. One barrel is fitted with a tiny focussing screen, the other with a changing-box containing a dozen instantaneous dry plates. The moment the focus has been adjusted with one barrel, a spring is touched which instantaneously causes a plate in the second barrel to be exposed. By an ingenious system of changing, a large number of small negatives can be secured in this way. From the nature of the apparatus the resulting photographs are necessarily very small, but they can be readily enlarged by means of one of the several excellent enlarging processes in vogue.

Again the disadvantage of having to carry about large quantities of heavy and brittle glass plates is receiving the close attention of photographers. Experiments are being made, apparently with much success, in the exposure of films detached from their original glass supports and stored for purposes of easy transit between the leaves of a book.

And now let us return to the *uses* of photography in connection with military purposes. The majority of these can be fitly gathered together under the single heading of Reconnaissance. The advantages of photography in the conduct of this important factor of the Art of War, are, as I have already tried to indicate, all more or less obvious. The foregoing remarks upon dry plate photography, too, were chiefly written with a view of shewing its adaptability to purposes of Reconnaissance. What could be more to the point, for instance, when knowledge of a given piece of country is required, than to send out a photographer armed with a light camera and three double slides, each containing two dry plates or still better two dry sensitive films? This amount of kit could be easily carried by a mounted officer who might well be accompanied by two mounted orderlies to carry back the double slides, when the plates in them had been exposed, into camp. The plates on their arrival in camp could be immediately developed by a second photographer, and copies printed and delivered in considerable numbers by the same evening. The printing could be accomplished with peculiar ease and cheapness by the Ferrotannographic process which has been recently invented and handed over to Government by Mr. G. M. Korper, the Head Draftsman of the Intelligence Branch at Simla.

The wonderful sensitiveness of gelatine plates would readily allow of instantaneous photographs of extreme interest and value to be secured during the actual progress of an action. If heliography can be employed during a battle, why not photography? The apparatus is of about the same bulk in either case, and a photograph could be secured in much less time than would be required to send any but the shortest of messages.

Many similar instances in which photography could be usefully employed will doubtless occur to those to whom the details of a campaign and the conduct of actual warfare are familiar.

An interesting though, in a way, a minor application of photography, is the reduction by its aid of despatches intended to be sent by carrier pigeons. During the siege of Paris this use of photography came greatly into play, as may be seen from the following graphic extract from a clever and readable book on photography by the French *savant* Gaston Tissandier:—"No one can have forgotten the service rendered by balloons during the siege of Paris nor the wonderful part played by carrier-pigeons which brought to the besieged city news from the outer world. But these birds, however strong they might be, could only carry with them very light burdens through the air. A thin sheet of paper two or three inches square was all the load that could be entrusted to these winged messengers. But how write orders, send despatches, give precise instructions in such a minute letter? The most able caligrapher could hardly make it contain the letters in a single page of a printed volume.

"Microscopic photography came to the assistance of the besieged; it solved the difficulty as no other art could have done; it reproduced on a film of collodion weighing less than a grain, more than three

thousand despatches, that is to say, the amount of sixteen pages of folio printed matter. \* \* \* \* \*

"Several of these films, representing a considerable number of despatches, were rolled and enclosed in a quill about the size of a toothpick. This light and novel letter box was attached to the tail of a pigeon \* \* \* \*. Each pigeon could carry twenty films in a quill, the whole not weighing more than fifteen grains \* \* \* \* \*

"Thirty or forty copies of the microscopic despatches were usually printed and sent by as many pigeons. More than 100,000 of them were thus sent to Paris during the siege.

"As soon as the small tube was received at the telegraph office, M. M. Corun and Mercadier proceeded to open it with a knife. The photograph films were carefully placed in a small basin of water in which were put a few drops of ammonia. In this liquid the despatches unrolled themselves. They were then dried and placed between two plates of glass. It then only remained to lay them on the stage plate of a photo-electric microscope."

It is perhaps hardly necessary to make any more than passing mention of the various ingenious methods that have been, from time to time, proposed of surveying by the aid of a "panoramic" camera or other similar contrivances. It may, I think, safely be inferred that if any of these processes had any real recommendations from a practical point of view, they would long ago have been adopted on a far larger scale than at present they appear to have been.

The cartographic applications of photography form the subject of a long, interesting and exhaustive report by Major Waterhouse, Assistant Surveyor General of India (Calcutta, 1870). Major Waterhouse visited the Topographical Departments of the principal Continental Governments, and his report embraces a large field of important and thorough research. But the use of photography in the production of maps and plans is a study in itself, and is moreover so well known that any detailed mention of it here is needless. It is sufficient to say that photolithography and photozincography are employed to a very large extent indeed in this direction, as well as in the reproduction of sketches, &c. with great rapidity and absolute accuracy.

It will be understood that I have not by any means attempted to give an exhaustive description of all the various applications of photography to military purposes. Many of these are of interest only to specialists, such as, for instance, those in connection with the Royal Arsenal at Woolwich and the School of Photography at Chatham. What I have rather tried to do is to suggest to military men that when they are desirous of taking up a new study which may be of use to them in their profession, they should turn their attention to the beautiful and fascinating art of photography. That they will never regret having done so, if they only begin from a right starting point, I am well assured; and a good starting point will be readily secured by any one who pays attention to the following golden rules:—(1) Buy a good apparatus to begin with, and never sacrifice quality to cheapness. (2) Learn to take a good negative before attempting to learn anything else.



It seems strange at first sight that in spite of the manifold improvements which of late years have been made in the appliances and *modus operandi* of photography, it should still attract such comparatively small attention amongst military men. Perhaps the real reason is the difficulty in obtaining instructions at once simple and sound. There is but one remedy for this, and that is the formation of classes at convenient centres to be attended by any officers or non-commissioned officers as might care to take up photography as a military study. A "sealed pattern" of photographic apparatus might be laid down, and members of the class be required to provide themselves with it before joining. In the case of non-commissioned officers the cost of the apparatus, which, if adequate arrangements were made with some good firm in England, would probably be not more than Rs. 150, might be advanced out of some regimental fund to an intelligent sergeant who on his return from the class could quickly repay it out of the profits which his knowledge would soon bring him. The class itself might last a month and be conducted on exactly the same principles as those already in existence for signalling and other courses of instructions. It would be, I venture to think, both useful and popular. By its means in the course of a year or two, every regiment in the service would have its two or three photographers who after once having passed their course would be of no further expense so far as their photographic knowledge was concerned, to any but themselves, and would moreover be able to become expert in their new acquirement without the least detriment to their own regimental duty.

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# United Service Institution of India.

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## CONTRIBUTIONS TO THE JOURNAL.

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EXTRACT *from the PROCEEDINGS of the Sub-Committee of the Council  
assembled at Simla on the 11th October 1883.*

\* \* \* \* \*

2. "Question whether the manuscripts of original papers sent for publication in the Journals, or in competition for a prize, should be returned to the writer or not."

*Resolved*,—"That the papers be not returned, except the writer expresses a wish to have them back, and pays the postage. A notice to this effect to be inserted in each number of the Journal."

By order of the Council,  
W. E. GOWAN, MAJOR,  
*Honorary Secretary.*



# ORIGINAL PAPERS.

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## I.

### CINERATORS AND SANITATION.

(Continued from Journal No. 55.)

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OFFICE OF THE INSPECTOR OF CATTLE DISEASES,  
*Saidápet, 27th April, 1883.*

*From J. MILLS, ESQ., M.R.C.V.S., Inspector of Cattle Diseases,  
To G. EVANS, ESQ., Inspecting Veterinary Surgeon, Madras Army,  
Ootacamund.*

SIR,—I have the honor to report that in continuing my experiments with cinerators, I have at last been able to devise one, which seems to me as near as perfect as one can get them, especially when only built of mud, and certainly an improvement on any I have yet built.

It differs from those referred to in my previous reports in the following particulars :—

- 1st.—The vent holes are much smaller.
- 2nd.—The opening at top is narrowed.
- 3rd.—They are higher in proportion to their breadth than the previous cinerators.
- 4th.—They cremate the carcasses much quicker.
- 5th.—The cost of building is only Rupees 4-8-0.\*

With these advantages, and after many careful experiments, I have come to the conclusion that this form of cremator will be found in every way preferable to any others, and I would strongly recommend its adoption.

\* When Coolies are hired for the work.

(Intd.) G. E.

Since building this cinerator, I have reduced to ashes one large Australian cow and three horses in it, and the time occupied was certainly less than on any other occasion.

For particulars as to construction, see attached plan marked Enclosure No. 1.

I have, &c.,  
(Sd.) J. MILLS, V.S.,  
*Inspector of Cattle Diseases.*

(True Copy.)

GRIFFITH EVANS, M.D.,  
*Inspecting Veterinary Surgeon.*

—o—

I. V. S. OFFICE,  
*Ootacamund, 6th July, 1883.*

TO THE HONORARY SECRETARY,  
*United Service Institution of India.*

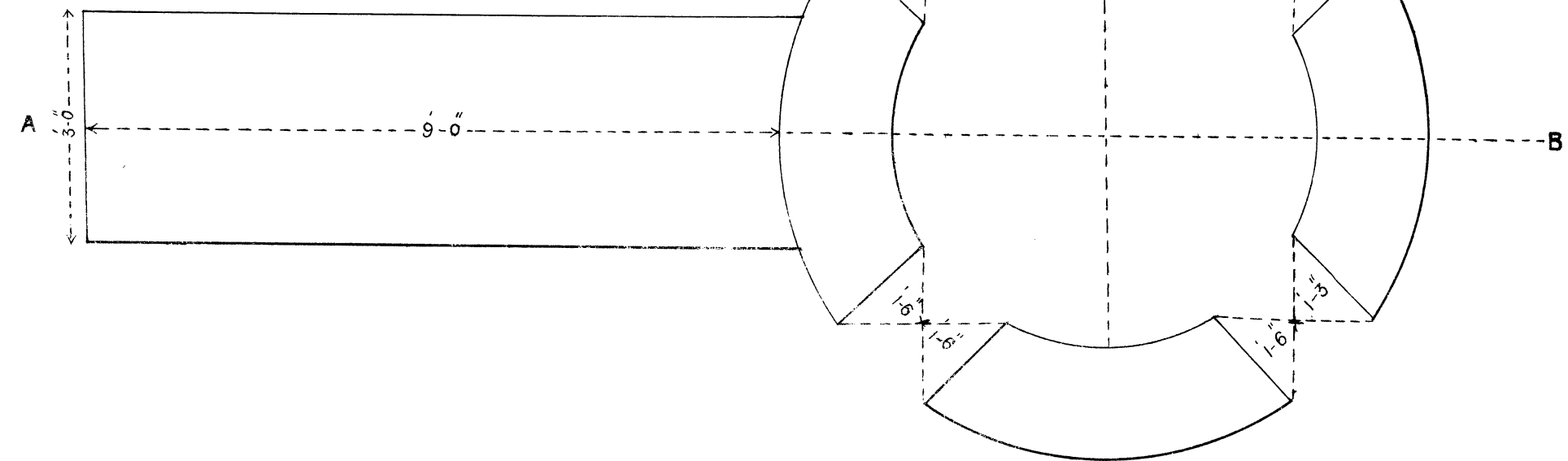
DEAR SIR,—I herewith send you an improved plan of cinerator by MR. MILLS. It is better adapted for ordinary use than the one published in your current Journal (No. 55). It has a better draught and generates more heat with less fuel. I hope you will find room for it in your next issue.

(Sd.) GRIFFITH EVANS,  
*I. V. S.*

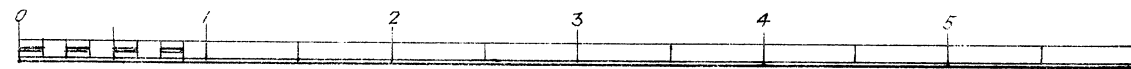
# IMPROVED CINCINATOR.

PLAN

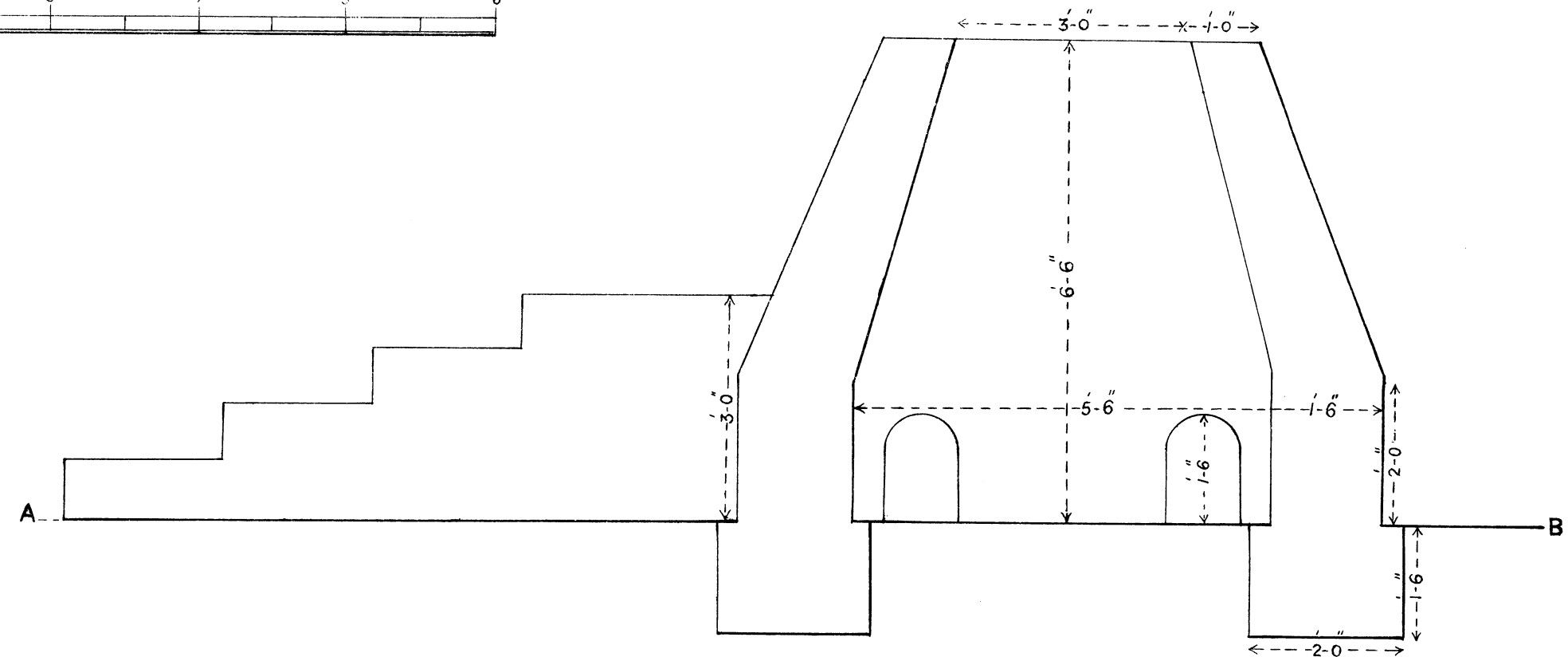
ELEVATION



Scale 2 ft to the inch.



SECTION ON A.B.



/Signed/ J. Mills V.S.  
Inspector of Cattle Diseases.  
St Thomas Mount.

/True Copy/  
(Signed) D. J. S. McLeod Major  
Offg. Deputy Q. M. General.



## II.

### THE SIEGE OF DELHI.

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*Text of a Lecture delivered at the U. S. Institution of India, Simla, on Friday, the 6th July 1883, by Colonel J. G. Medley, R.E.; Lieut.-General the Hon'ble T. F. Wilson, C.B., Chairman.*

If the importance of a military operation is to be measured by the results depending on it, then must the Siege of Delhi ever rank as one of the most important operations of the British Army, for upon its issue practically rested the fate of the British Empire in India. Or, if that importance be held to turn rather upon the difficulties that were surmounted, and the unequal nature of the conflict, then also may the Siege of Delhi challenge comparison with any other, for it was undertaken against almost overwhelming odds, at the most unfavourable season of the year, and in the teeth of difficulties which seemed well nigh insurmountable.

Fortunately, those difficulties were of a nature which the best qualities of the British character were eminently adapted to meet. For, what was required at Delhi, and what eventually secured success, was a dogged tenacity of purpose, and that obstinate inability to understand when we were beaten, which so puzzled the great Napoleon, and which has so often given us victory in defiance of all the rules of war.

It is because I think such a study must be useful and interesting to soldiers at all times, and because with the lapse of time and in the blaze of more recent triumphs those of the past are apt to be forgotten and—what is all-important—the lessons that they teach us, that I ask your attention to-day. There are still a few among us who have a vivid recollection of those terrible times, which seem separated from our own by so wide a gulf; but their number is rapidly diminishing, while it is impossible not to feel that a similar struggle is always on the cards for us in India, even though it be renewed under different conditions from the last. Many of these conditions would no doubt now be in our favour—quite as many would, I think, be against us. Let us learn, then, from the experience of the past what to avoid and what to follow; so shall we be ready, when the time comes, to fulfil our duty and to hand down to our children intact the great Empire bequeathed to us by our fathers.

It is not my intention, nor would it be possible in the compass of a short lecture, to give you a detailed account of the Siege; that has already been done by Mangleson in a way that leaves little to be desired.



But when I was again invited to lecture here, it occurred to me that a brief narrative of my personal recollections of that Siege might perhaps be found interesting, and that you would pardon the necessary egotism of such a form of narrative for the sake of the story itself and the lessons to be drawn from it.

In May 1857 the great storm-cloud of the mutinies burst upon us in India with a terrible suddenness. There were those as usual, wiss after the event, who told us we ought to have been prepared, for they knew what was coming. Speaking as one of the general multitude, neither wiser nor stupider than those around me, I may fairly say that we were quite unprepared, and I do not believe the Government was a bit more prepared than ourselves. On the 12th May it was known that the native troops had revolted at Meerut, had marched to Delhi, had been joined by the troops there, and that the whole city, fort and cantonments were in their possession, the few Europeans having been killed or having fled, and that the old King of Delhi had been proclaimed Sovereign of India.

The first feeling among us on receipt of this news was, I think, one of wrath and indignation rather than dismay. It was believed that the outbreak was a mere local affair aggravated by bad management, and that as soon as Delhi was re-taken, which would doubtless be in a few days, the whole danger would be at an end, and the mutiny stamped out, as had happened more than once in days gone by. But as day after day went past without our troops being able even to move from Umballa, the difficulties of our position began to dawn upon us. It was soon known that the taint of mutiny had spread to almost every station in Upper India, wherever sepoy of the regular army were quartered, and that those who had not already risen were probably only waiting their opportunity to do so. And then arose the unpleasant doubt whom could we really trust beyond the handful of white men scattered here and there over the vast country? If those who were bound to us by the strong obligations of military service, and who had eaten the Government salt for so many years, were now turning upon us without rhyme or reason, who then was safe? It was impossible not to fear that the whole native population might be implicated more or less, and that we were in for that most terrible of all wars—one of race against race—in which we should be outnumbered a thousand-fold.

Such, certainly, were natural fears, and with many they actually prevailed; but not, I think, with the great majority. We felt, instinctively as it were, and without much reasoning about it, that our consciences were clear in this matter; that the people of the country, if they did not specially love us, at any rate trusted us, and were content with our rule; and that our enemies were divided among themselves and incapable of combining. Above all, we had that confidence in ourselves and our country, and that pride of race, which we knew had given us, in the providence of God, our ascendancy in India, and which

we felt would enable us to retain it so long as we were true to ourselves and to those who had gone before us. Meanwhile, events were marching rapidly, and not a day passed without news of fresh outbreaks, or rumours more or less authentic. It was at Lahore that the danger was first boldly confronted, and the example set there was followed elsewhere, though not always with the same success. By the prompt action and admirable management of Brigadier Corbett, who commanded there, the native regiments at Mean Meer were disarmed without bloodshed, and the forts at Lahore and Umritsur occupied suddenly by European detachments, the native garrisons being turned out. The responsibility incurred was most serious, for had any conflict occurred at Mean Meer, the European officers with the native troops would almost certainly have perished with their men, and an outbreak would probably have been precipitated at every station in the Punjab. As it was, the success of the measures at Lahore cowed the disaffected, and gave confidence to the authorities at other stations to go and do likewise.

I was then serving on the Trans-Indus Frontier, where troops of the Punjab Irregular Force were alone employed, and the first thing that brought the situation home to us was an urgent request from Multan, 50 miles distant, for the despatch of some of the Frontier troops to that station to disarm the 62nd and 69th N. I., as the only Europeans there were some 60 men belonging to the garrison battery, and it was known that the native cavalry could not be trusted. That night, the 2nd P. I. and a squadron of the Punjab Cavalry marched for Multan, and two days later the disarmament of the regiments I have mentioned was cleverly effected. It was a bold expedient, but there was no other resource available, for it was felt that if the Punjabis were to make common cause with the Poorbeahs, our hold on the Punjab was gone. But we all drew our breath more freely when we heard that everything had passed off quietly.

The keynote was thus struck of the tune that was to be played in the future, so far as the Punjab was concerned—our old enemies were to be played off against our old friends and our now rebellious soldiery. The question was—how long could the antagonism be trusted to last? By those who knew the Asiatic character, the reply would be, “only so long as you show confidence in yourselves. Do not strain the situation too far.” Action was, however, indispensable, and while the Press and the English public were crying out for vengeance against the whole race, and declaring that it was madness to trust any but white men, John Lawrence was quietly enrolling 30,000 Punjabi soldiers to take the place of those who had revolted, and sent a large portion of his best Frontier troops to re-conquer Delhi.

The small force assembled at Umballa for that purpose was struggling with the usual difficulties of want of transport, which seems fated to attend every British military expedition, and it had only got as far as Kurnal when the Chief himself died of cholera. He was succeeded

by Sir Henry Bernard, who had done good service in the Crimea as chief of the staff, but who had only recently arrived in the country, was quite without Indian experience, and was almost overwhelmed with the difficulties before him. The advance was, however, continued, and the army being joined on the road, by a smaller force from Meerut, encountered the rebels on the 9th June at Badlee-ka-Sarai, outside the walls of the city of Delhi. The rebels' intrenched position was attacked and carried, not without heavy loss, and the rebels chased within the walls, our troops halting on the Ridge. It was afterwards said, as at Sebastopol after the Alma, that if we had only pushed on, Delhi would have been ours. But the men were utterly exhausted by the fearful heat and their previous exertions, and to have advanced would have been to risk everything on a single *coup*, with utterly insufficient means, while failure would have been ruin.

The position on the Ridge was fiercely attacked by sorties from the City on the following day, and for many days afterwards. Then the new Commander of the force also succumbed to disease, and his successor, General Reid, broke down as well, leaving the command to General Archdale Wilson; while cholera, sunstroke and fever daily claimed their victims amongst the soldiers. The Press reproachfully asked why we did not advance and storm Delhi, while our small force there assembled, with one-third of its numbers *hors de combat*, had the greatest difficulty in maintaining its position at all, and continually attacked on the right flank and even in the rear, was in truth much more besieged than besieging. It was in fact Sebastopol over again—with one flank tolerably safe, the other in the air, the force was utterly inadequate to the task before it; while the enemy held to the City entirely uninvested, and could go out and in as they pleased. We were indeed much worse off than at Sebastopol, for there our communication was by the sea, of which we held undisputed possession from the first. At Delhi, our communication was by the Grand Trunk Road with Umballa 120 miles off—a long, thin, utterly indefensible line, weakly guarded here and there by some irregular levies, while it was quite uncertain how long our base (the Punjab) could itself be considered safe or reliable.

Had the enemy possessed but one General capable of realizing the weakness of our position, it would have been easy for him to have obtained possession of our line of communication, and to have compelled us to raise the siege. As it was, reinforcements and supplies came to us unimpeded from the Punjab, though the former barely sufficed to fill the gaps caused by sickness, and daily fighting. Twice was it determined to end the suspense by a daring attack on the City, and each time was the order countermanded at the last moment; while once it is said the situation was considered so desperate that orders were actually written out for blowing up the guns in battery and raising the siege, but fortunately without being carried out.

All through June and July this state of things continued, while in

other parts of the country the mutiny raged unchecked, and the North-West Provinces, Oudh, and Central India were practically no longer under British rule. The terrible catastrophe at Cawnpore had annihilated our small force there, and the little garrisons at Lucknow and Agra alone were left as islands in the midst of the waves. Even in the still loyal Punjab it was doubtful how much longer the strain would last. Almost every station had its episodes to recount of outbreak, or, what was worse, of daily, and nightly alarms, and of a state of constant suspicion of the very servants of one's household, far more trying to bear, because of the forced inaction, and of the necessity of showing a confidence that was not, and could not, be felt. Happy were those whose fears were confined to themselves, and who had neither wife nor children with them; or, worse still, away in some distant station with which communication could only be held at long and uncertain intervals.

It was, I know, a blessed relief to me to get my orders at last to join the army before Delhi, and to feel that if danger had to be faced it would at least be in an open and honorable form, and not full of nameless and uncertain horrors. I rode to Multan and travelled by mail-cart to Lahore, where I paid my respects to the Chief Commissioner, John Lawrence, whom I found in his shirt sleeves working at his desk. On hearing that I was going to Delhi, he expressed a hope that we should soon be inside, for, said he, "I have now sent down Nicholson with every man that can be spared, and if you don't get in soon, I don't know what we shall all do here."

Picking up a brother officer at Lahore, we travelled down the Grand Trunk Road by mail cart to Umballa, where we overtook Nicholson's column, then on the march, and resuming our journey after a day's delay, at length drove into the camp at Delhi, and pulled up at the Post Office tent, without adventure or excitement of any sort. I found some old friends and many new ones in the Engineer Brigade, which was encamped with the rest of the force in the old cantonment behind the Ridge. Most of the houses had been burnt or dismantled, but a few had escaped the general wreck, and we had been fortunate in securing one of these for a mess-house. The next morning I accompanied our second-in-command, Captain (now Sir) Alexander Taylor to see the position.

The front of this was practically defined by the famous Ridge, the nearest point of which on the right was 1,200 yards from the city walls, where we had a battery to protect our right flank and return the fire of the Moree Bastion. Here the Ridge practically terminated, the Grand Trunk Road running under it on into the city, and separating it from the Paharipore and Subzee Mundi suburbs, both until recently occupied by the enemy, but in the latter of which we now held a serai as a fortified post. It was in this part that most of the severe fighting had taken place in June and July, when the enemy obtained cover close to our position, and swarming round our right flank even

attacked our rear. But latterly our position here had been strengthened, and an advanced post constructed on the right flank at the Sammee House (as it was called), and which is still to be seen.

Other prominent points along the Ridge were occupied by pickets, such as the Mosque, the Observatory, and Hindu Rao's house, where a strong detachment was kept, to support any point attacked. The Ridge bristled with batteries and breastworks, the remains of which may still be traced, and in the early days of the siege had been the scene of a good deal of hard fighting, but when I joined, about the 1st August, the ground had been cleared, the positions along the Ridge strengthened, and we suffered only from an occasional shot or shell thrown from the bastions 1,500 to 1,800 yards distant. The last position on the Ridge was the Flagstaff Tower, whence a good general view was obtained of the broken ground, trees, houses, and compounds, which lay between us and the city, and which had now become the general morning lounge for all the camp gossips.

Beyond the Flagstaff Tower the Ridge runs well back from the city, but we held two or three advanced posts between the Tower and the river, the chief of which was Metcalfe's house and compound, where the Engineer Park was afterwards established.

It was clear enough that we were not besieging the city, but simply holding a strong position, of which the Ridge was the key and main feature, and that when the time came for an onward movement, our offensive operations must be undertaken considerably in advance of the present position.

The camp itself was well supplied, and men and officers were too hard-worked to have time for uneasy forebodings as to the work that lay before them, for practically half the force was on picket duty every day. The troops in camp then, or shortly after, were the 9th Lancers, part of the 6th Carabineers, and of the 1st, 2nd and 3rd Punjab cavalry and Hodson's Horse, the 8th, 52nd, 60th, 61st, and 75th Regiments, the 1st and 2nd Bengal Fusiliers, the 1st and 4th Goorkhas, the Guides, 1st, 2nd, and 4th P. N. I., the Kumaun and Biluch battalions, and some auxiliaries of the Kashmir and Jhind Rajas, besides Horse and Foot Artillery. The Engineer Brigade included Colonel Baird Smith, the Chief Engineer, one Captain as second-in-command, now Lieutenant-General Sir A. Taylor, Lieutenant Chesney, our Brigade-Major, and Lieutenant Brownlow, in charge of the Park and 16 other subalterns. We had three weak companies of the old Bengal Sappers, about 1,200 Muzbi Sikhs enlisted for fighting and trenchwork, and some 800 unarmed coolies from the Grand Trunk Road, whom we called the Delhi Pioneers. This sounds like a large force, but all the regiments were very weak, several numbering less than 300 men. Since the opening battles of the Hindun and Badlee-ka-Serai, the army had been engaged almost daily in actions or skirmishes, more or less severe, and this, together with the heat of the weather and the great sickness, had kept one-third of the whole force virtually *hors de combat*, while some

regiments, such as the Guides and the 1st P. I., had lost the whole of their English officers, two and three times over. The total effective force now amounted to 3,300 Europeans, 5,500 natives, and about 2,500 irregular levies. The wear and tear of the incessant duty and the harassing nature of the work had no doubt told heavily on the men, and some of the regiments were a good deal disorganised. But others again were in first-rate fighting trim, notably the 9th Lancers, 60th Rifles, 1st Bengal Fusiliers, the Goorkhas, and Coke's Rifles. There was happily a very friendly feeling between the European and native troops fighting on the same side, and I cannot say that I remember any special animosity being felt even towards the enemy, or Pandys—as he was generally termed. He was simply the enemy whom it was our business to oppose, to circumvent, and if necessary to kill, but that was all; and when he fought, well which he often did, I think we felt rather friendly to him than otherwise.

About the 7th of August General Nicholson's column marched in, he himself having arrived a few days previously. Then came a period of waiting for the arrival of the siege-train from Phillour, which had hitherto been delayed, I don't know why. The enemy sent out a considerable force to intercept it, and Nicholson being detached to prevent them, attacked them at the Najufgurh Jheel, and inflicted on them a severe defeat, after which the train arrived unmolested.

Shortly afterwards the 4th P. I. joined us—one of the best of the Frontier regiments—and it was now rumoured that the last available reinforcements had reached us, and that we were to go in and win if we could. There can be little doubt that even then our General had many misgivings as to his force being strong enough for the task, but John Lawrence urged him on, and Nicholson was there to infuse his own dauntless spirit into his Chief.

It was impossible for John Lawrence not to feel the full gravity of the situation, knowing as he did that he had stripped the Punjab of its best troops to reinforce us, and that the whole situation was one of intense strain. But it is equally impossible not to sympathise with the anxiety and reluctance of General Wilson before committing himself to such a struggle. With a force numbering barely 10,000 effective men he had to attack a walled city seven miles round, containing 100,000 inhabitants and some 40,000 soldiers, plentifully supplied with arms and ammunition. Although the fortifications were not perhaps formidable in a scientific point of view, they were anything but contemptible, consisting of a masonry wall 24 feet high, in good repair, with a ditch outside 16 feet deep, having a musketry parapet all along, and regular bastions at intervals in which heavy guns were mounted, while the gateways were protected by outworks, and the lower part of the wall was covered by a good glacis.

The point of attack admitted of no doubt. The necessity of preserving our communication with the Punjab, and the protection afforded to our left flank by the river, pointed to the north front as the only

one to be assailed with a chance of success. The weakness of our attack, technically considered and irrespective of the question of numbers, consisted in this, that our right flank being in the air was exposed to enfilade or direct attack, without any protection, but such as could be given by our overlapping it, above and behind from the Ridge. It was determined therefore to strengthen our right as much as possible, and even to make a feint of attacking there, while the real attack was to be made on the left.

Accordingly, the first step in advance was taken on the 6th September by the establishment of a battery of eight field guns on a plateau on the right near the Samee House, and about 300 yards in front of the Ridge, or 900 yards from the walls. The plateau battery was successfully made and armed, though not without loss, and Lieutenant Warrand, R.E., lost his left arm in completing it. This battery did good service to the end of the siege, being very valuable in repelling sorties and commanding the ground on the right by which attacks would naturally be made.

On the evening of the 7th September the Siege was regularly begun by the construction of No. 1 Siege Battery of ten heavy guns and howitzers on the right, at a point 700 yards in front of the Moree Bastion, the fire of which it was meant to silence and to cover the advance on the left, while at the same time it would lead the enemy to think that the real attack would be made on the right.

The working and covering parties paraded in the evening at Hindu Rao's house, and were marched down at dusk under the guidance of the Engineers, who traced the battery, and set the men to work. As it was of great importance to construct and arm this battery before its exposed position could be discovered, it was determined to do the whole work in a single night. For this purpose, and as the soil was rocky and few men could be spared, fascines and sandbags were sent down in large numbers, and the mass of the work was chiefly constructed of them, the embrasures and interior slope being reveted with gabions in the usual manner. Hardly had the working parties begun when a bright flash from the Moree was followed by a shower of grape which knocked over several of the workmen, and this was followed by another shot equally well aimed. Had the fire been continued, it would have been impossible to go on with the work; but whatever the reason was, no further attempt was made to molest us through the night, and about 2 A.M. the guns came down and the ammunition was safely stored in the field magazines, but when daylight dawned the work was very far from complete, and the platforms for the guns were only just begun. It was absolutely necessary, however, to send away the greater number of the men for whom there was no shelter in the battery, and scarcely had this been done when the Moree Bastion opened fire, and we suffered heavily, as for some time our guns could make no reply. Round shot, shell and grape were sent at us liberally, and it was a matter of great difficulty to get the platforms laid. Gra-

dually; however, gun after gun was mounted on its platform and brought to bear on the Moree, and a steady, accurate, concentrated fire poured on the bastion until it was all but silenced. I had been left to complete the battery, and when the last gun opened fire was glad enough to escape to our lines with a whole skin and to enjoy a four hours' rest. Our casualties were 70 men.

So far all had gone on well on the right. Let us now see what was doing on the left. On the evening of the 7th the Koodsia Bagh was seized and occupied by a strong guard, the mosque in that garden thenceforward being used as a shelter for the main guard of the left attack.

The same evening the house known as Ludlow Castle was occupied for a similar purpose, and at dusk on the 9th I helped to trace and construct the main breaching battery in the compound of that house, and 500 yards from the Kashmir Bastion. The battery was in two portions—the right half consisting of nine 18-prs., the left of nine 8-inch howitzers, and like the right battery, it was built largely of fascines and sandbags to save labour, the sandbags being filled with earth in a *nulla* close by, which served to some extent as a covered parallel, and whence the bags were carried to the battery site. Two nights were, however, occupied in its construction, work being knocked off during the day, when, if the enemy had understood their business, they would have knocked it all to pieces with their guns, or seized it by force and pulled it down before it was armed.

By the morning of the 11th both portions of this Battery were ready to open fire, and on the signal being given the ball was opened by a salvo of 18 guns, the men jumping on to the top immediately after, and giving a ringing cheer. Then a steady and accurate fire was maintained on the Kashmir Bastion and the adjoining curtain—every gun being carefully laid—and it was a pleasant sight to see first the guns in the bastion entirely silenced, and then the masonry wall of the curtain tumbling down in huge masses into the ditch, while the shells from the howitzers were made to burst just as they reached the parapet and stripped it off bit by bit.

Still further on the left another battery had been opened opposite the water Bastion. A small building known as the Custom House had been seized and occupied, and under cover of its walls this battery was built only 180 yards from the bastion, the wall being thrown down when the battery was ready. The construction of this work, however, at short musketry range cost us dear; ten men were killed and 29 wounded out of the first working party sent down, and, to their honour be it said, these men were some of the Hindustani coolies whom, as I have said, we had enlisted for trench work. This battery was only made and worked at a heavy loss of life to the end; it was armed with six 18-prs., and its fire at this short range was terribly effective, dismounting the guns of the water Bastion, and beating the rampart into a shapeless mass.



On the night of the 10th a battery of heavy 8-inch and 10-inch mortars was opened in the Koodsia Bagh behind the mosque, and a battery of light mortars from a position slightly advanced. The mortars were chiefly worked at night, when our guns were silent, to prevent the breaches being repaired.

During the whole of the 12th and 13th the 50 guns and mortars now in battery maintained a heavy and continuous fire on the north front of the devoted city; but we did not have it all our own way. The enemy stuck bravely to their guns in the bastions, firing them whenever they got a chance; they mounted light guns on the Martello towers in the curtains, which could not be fired at from our embrasures; and, what was far more serious, they brought out four guns and placed them in battery on the right so as to enfilade our principal breaching battery, and make it all but untenable. The right epaulement battery was lengthened and an additional traverse constructed, but so severe was the enfilade fire that word was at length sent to General Wilson that the guns must be captured or silenced at any cost, or it would be impossible to work the battery any longer.

Besides this artillery fire, the enemy threw swarms of skirmishers into the broken ground in front of the batteries, who maintained an incessant musketry fire day and night along the whole front of our attack, and made it a matter of serious risk to any one who ventured out of the shelter of the batteries and trenches. They even threatened more than once to storm the batteries by main force, and our guns were occasionally charged with grape instead of round shot or shell, and ploughed up the ground in front with a torrent of shot. I certainly never wish to spend such another 24 hours as I spent on duty in that battery after all my active work was finished, and when I had simply to look on and pretend that I rather enjoyed it than otherwise.

The heat of the weather was severe. The numbers were so few that for the last 48 hours it may be said that the whole of the Artillery and Engineers, and almost the whole force in fact, were continuously on duty, and such a strain of course could not long continue. It was, however, some satisfaction to feel that the time so often awaited during four anxious months had at last arrived, and that if all went well another few hours would see us inside the rebel city that had defied us so long.

On the evening of the 13th I received orders from the Chief Engineer to take another officer with me—Lieutenant Lang—and to examine the main breach to see if it was practicable for assault, while two other officers—Greathed and Hovenden (both now dead)—were to do the same at the left breach. It was no doubt an honourable task, but I cannot say it was an agreeable one, for it involved creeping through the enemy's skirmishers in front, crawling up the glacis, and getting down into the ditch. However we managed to do it with an escort of six riflemen, without anybody being hurt, and at eleven

o'clock that night I rode back to camp and reported to the Assistant Engineer that the main breach was practicable, and that there was no gun in the flank of the adjoining bastion.

The arrangements for the assault had been already made in anticipation, and the detailed orders issued, and at 4 A.M. I found the columns drawn up in camp, in readiness for the assault.

It was a bright starlight night, and the scene was undoubtedly a most impressive one. The roar of the batteries as they fired with redoubled energy up to the last moment fell grandly on our ears, and the air was lighted up with the shells and rockets flying over the devoted city. It was impossible for the most thoughtless not to feel the serious nature of the struggle before us, and the heavy issues that were pending on the result of that day's fighting. General Nicholson, for whom the day then dawning was to be the last on earth, wore his usual look of quiet resolute determination. General Wilson looked almost worn out with anxiety as he gave his final instructions and left the columns to tramp silently and steadily onwards to the storming of Delhi.

The arrangements for the assault were as follows :—

The first column, 1,000 strong, was to storm the main breach and escalate the face of the Kashmir Bastion. The second column was to assault the breach in the Water Bastion, 850 strong. After these two columns had got in they were to turn to the right and clear the walls of the enemy along the whole north front and up to the Lahore Gate. The third column—950 men—was to enter by the Kashmir Gate, which was to be blown in, and it was then to advance on the Jumma Musjid. The fourth column—2,000 men—was to advance from Hindu Rao's house on the Ridge, fight its way through the suburbs, and enter the city by the Grand Trunk Road at the Cabul Gate, where it was hoped it would meet the first column after the latter had got inside. The fifth column—1,500 men—was to be in reserve on the left, and was to follow the first column. Engineer officers were attached to each column to guide it to its position, my own place being to guide the first division of the first column to the main breach which I had visited that night. The whole of the cavalry and horse artillery were to remain in readiness on the right to repel any sorties or attacks on the camp.

It was already broad daylight when the signal for the advance of the columns on the left was given by the Rifles dashing forward with a cheer, extending in skirmishing order along the glacis, and opening fire on the defenders of the ramparts. The head of the first column then advanced steadily, the men in front carrying ladders, which were required for the ascent of the masonry scarp of the ditch. On arrival at the foot of the glacis the column deployed and advanced towards the breach. But so heavy a fire was opened from the breach, the broken parapets on the walls, and from the bastion that the advance was for the moment checked; the men, throwing down the ladders as they saw man after man struck down, unslung their rifles to return

the fire. The enemy seeing our hesitation redoubled their fire, shouting and yelling, and even catching up stones from the breach in their fury, and dashing them down, dared us to come on. The check was, however, but momentary. With the help of a sergeant of the 75th I dragged two or three ladders to the edge of the ditch, threw them down, and then the stormers advanced; Captain Fitzgerald, who commanded them, being killed at the bottom of the ditch. As soon as the enemy saw we meant to go on they gave way and the breach was won, and the troops swarmed up the main breach. The first man I met on the top was General Nicholson, who, I believe, had gone up with the party escalading the bastion, and who desired me to stay on the breach and direct the men to form up in the main guard below—it was the last time I saw him.

The second column had assaulted the left breach with the same success, though both the Engineers guiding the column, Greathed and Hovenden, fell severely wounded, and 29 out of 39 laddersmen, were shot down. The breach was, however, at length won, but proving rather difficult to ascend, most of the men strayed off to the right and went in at the main breach.

The third column advanced on the Kashmir Gate as far as the turn of the road, and then halted, while the explosion party went on to perform their dangerous task. Lieutenant Home, the senior Engineer, advanced to the gate with four native sappers, each carrying a 25lb. bag of powder, which they laid at the foot of the gate, and then retreated—Lieutenant Home jumping down into the ditch. So paralysed did the enemy seem at the audacity of the attempt that they only fired one or two straggling shots and made haste to close the small wicket gate with every appearance of alarm. It was now Salkeld's turn; he advanced with four other men, who laid their bags successfully, though two fell mortally wounded; and when Salkeld attempted to fire the fuse with a lighted port-fire, he was shot through the leg and arm, and fell to the ground calling to Sergeant Burgess to fire the charge. Burgess advanced, but was instantly shot dead. Sergeant Carmichael then stepped forward and succeeded in the attempt, but fell at the same time mortally wounded. Sergeant Smith, seeing him fall, next went forward, but observing that the charge was already lighted, seized Salkeld in his arms, and with the help of Bugler Hawthorne, got him down into the ditch just before a terrific explosion blew open the gate, and covered the little party in the ditch with dust and *débris*, though sheltered under the drawbridge. On ascertaining that the gate was blown open, Home ordered the bugler to sound the advance, and the 52nd rushed through the gate with a cheer. That is the story of the blowing in of the Kashmir Gate, which wants no words from me in praise of the heroism and cool daring of the deed. Salkeld died of his wounds, Home, Smith, and Hawthorne were recommended for the Victoria Cross, which poor Home did not survive to wear, being killed a fortnight

later while blowing up the Malagurh Fort. Havildar Mahdee and two Sappers received the Order of Merit.

Thus the first three columns had accomplished the first part of their task, but No. 4 was not so fortunate. In advancing through the suburbs towards the Lahore Gate, they came under a very heavy fire. The Commanding Officer, Major Reid, of the Goorkhas, was struck down, so was the Engineer guiding the column, Lieutenant Maunsell. The men lost their way, the troops of the Kashmir Contingent, who formed part of the column, fell into a panic, and the column after suffering heavy loss had to retreat, the Guides covering the retirement under Lieutenants Shebbeare, McLean and Murray. This failure was a serious misfortune, as it gave courage to the enemy at our weak point on the right. The rebel swarmed out in large numbers, and showed an intention of storming our batteries and even our camp, and only the firm front showed by the cavalry and artillery under Brigadier Hope Grant checked them. Our men, however, were exposed to a very heavy fire without the possibility of charging, and no harder work or more gallant service was that day done than by these troops who so long bore unflinchingly this galling fire without the possibility of moving.

Meanwhile, though we had certainly got in on the left, matters were not going on well. The first and second columns, in clearing the walls and working their way towards the Lahore Gate, were checked by the fire from a well-placed and well-served gun in a narrow street. Nicholson, with his usual impetuosity, rushed to the front and fell mortally wounded, and the column fell back to the Cabul Gate, whence no further advance was made that day.

The fifth column advanced on the magazine, but the fire from that building and the adjoining houses was so heavy that they could not carry it, and the third column was also beaten back from the Jumma Musjid. The third and fifth columns eventually occupied the Church, the College, and the adjacent houses, and their further advance had to be postponed for the present. The Fort and Palace, the magazine, the Jumma Musjid, and four-fifths of the city were still in the enemy's possession, and our position was anything but secure. More than 1,200 men had fallen in the assault, including 10 Engineers out of 17 engaged and 56 other officers. Some of the troops were very much disorganised, and the whole camp, with 3,000 sick and wounded men, was terribly open to attack, while Nicholson lay dying and many of the best officers of the force, like Chamberlain, Showers, Daly, and Coke were incapacitated by previous wounds. It is no wonder if the General's heart failed him even in the midst of his partial success, and that for a moment the thought occurred to him of retreating to his camp. But the success, though only partial, was a very real one, and under the circumstances quite as much as could have been expected; while the moral effect of the success was in truth decisive. The rebels had

already lost heart, and were prepared to retreat as soon as they were quite sure we meant to advance.

But the troops urgently needed rest, and all the 15th. was employed in securing the positions won and getting ready for a further advance by making proper arrangements for fighting our way through the streets of the town—always a difficult and dangerous operation, unless well managed. On the 16th the magazine was stormed, with slight loss, and the Kishengunj suburb was abandoned. The former contained 170 guns and large supplies of ammunition. On the 17th and 18th the advance was continued through the streets by sapping through the houses from below, and then turning the tallest of them into advanced posts, whence a fire was directed upon the adjacent roofs. In this manner the advance, though slow, was made secure, and soon the enemy lost heart and gave way in every direction. On the 19th the Burn Bastion, Lahore Gate, Chandni Chouk and Jumma Musjid fell, and on the 20th the Fort and Palace were occupied without trouble after the gate had been blown open, having been virtually abandoned. By the 22nd the remainder of the city was evacuated, and the gates and every strong position secured by our troops. On the 20th the old King of Delhi was captured by Hodson, and his two sons shot on the spot to prevent their being rescued.

Thus ended the siege of Delhi. Between the 1st of June and 22nd September the force had fought ten general actions and innumerable skirmishes, besides fifteen days of open trenches, during which the actual siege lasted. Out of a force never numbering 10,000 effective men, it lost 1,000 killed and three thousand wounded, besides numbers who died from disease and exposure. Of the above, nearly half the loss occurred in the fortnight of the actual siege. The fall of Delhi was the first great blow struck at the rebels' cause and the breaking of the neck of the Mutiny, and this was done without the aid of a single man of the reinforcements sent from England.

My story has been told very badly if you do not feel with me that few armies have deserved better of their country, and that every man and officer who belonged to it does well to be proud of the little silver clasp that tells that he once served with the Delhi Field Force.

At the close of Colonel Medley's lecture, Lieutenant-General the Hon'ble T. F. Wilson rose and said—

"LADIES AND GENTLEMEN,—I am sure that you will all have listened with the same amount of pleasure and the same degree of interest that I have to the admirable lecture which has just been concluded. I do not think that the annals of war contain many more brilliant achievements than the capture of Delhi in the summer of 1857. The story of how a small body of our countrymen, by their indomitable perseverance, energy, and long-sustained courage overcame the almost insurmountable difficulties by which they were surrounded, and finally triumphed over the enormous masses arrayed against them, is one

that must have a powerful fascination for Englishmen and Englishwomen, and more especially for those of them who reside in India; and I think the English character will indeed have materially changed if ever the day comes when that wondrous tale of English heroism fails to inspire curiosity, interest, and national pride.

"I congratulate you and I congratulate myself that we have this afternoon had the great advantage of hearing the thrilling tale related to us by one who took a prominent part in the great struggle, and who is consequently well qualified to convey to us a true and accurate picture of all that occurred. I have said took a prominent part, because the gallant lecturer, with that modesty which ever accompanies true merit, has made as scant mention of himself as the narration permitted him. Well! I am not altogether sorry that Colonel Medley's constitutional or chronic modesty has induced him to preserve silence regarding himself, because it has left to me the agreeable duty of enlightening you as to what he did at Delhi. My information is derived from that best of all authorities—the *Gazette of India*—announcing the fall of Delhi.

"I find that Colonel Medley was employed in examining the breach to ascertain its practicability on the night previous to the assault; that on the following morning he accompanied Nicholson's stormers, and was one of the first of those who stood on the crest of the breach, and that notwithstanding that he received a severe gunshot wound, he did not quit the column until it had lodged itself in the town; and I am sure that you will agree with me that he well deserved those words of praise which are to be read in the *Gazette* of the day.

"When Colonel Medley was asked to lecture at this Institution, I think that in the choice of a subject he selected wisely, for I do not think that any other could have been more interesting than the one to which we have just listened, and the largeness of this assembly testifies to the correctness of this belief.

"I regret the absence of my gallant friend the Commander-in-Chief, who played a part in the great drama enacted at Delhi in 1857, and who, though then only a Captain, won for himself a prominent place in the despatches of the General Commanding. Had he been here this evening he would, no doubt, have favored us with some observation as to what fell under his own immediate observation. I also regret Sir Donald Stewart's absence on your account, because, had he been at Simla, he would have filled the position I at this moment occupy, and would have done so more to your satisfaction than I am capable of doing. I will not detain you further, and have now the pleasure to convey to Colonel Medley the thanks of this large meeting for the pleasure he has conferred on us this evening."



### III.

## MULE-BREEDING.

A PAPER BY LIEUT.-COLONEL W. TWEEDIE, C.S.I., B. S. CORPS.

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AMONG the frequent references to mule-breeding contained in the "Journal of the United Service Institution," Spanish, Arab, Bukhara, and Indian donkeys have been those chiefly pointed to as eligible in this way; and it has been stated by a high authority that the Bukhara donkey-stallion is the very best that can be procured for breeding pack-mules for Indian service. Against Arab donkeys the drawbacks are alleged: (1), that they are susceptible to cold, and therefore require considerable care; and (2) are too apt, from their colour being white, to get grey mules.

This perhaps shows that the Arabian donkeys hitherto imported to India have been chiefly, if not entirely, of the slight, well-bred variety, native to the hot and arid province of Hassa, or Ahsa, in Najd. These donkeys are in high favour in Baghdad, and other towns of Turkish Arabia, for saddle purposes. Of course they are much used also for mating with *Kadish* (pony) mares; and the produce often turns out even better than their sires for riding through the streets, or performing journeys on.

But a glance at the mules used, in Baghdad for instance, for the carriage of heavy loads, shows that they are not the produce of the white donkeys now referred to; and, on inquiry, it would appear that the best of them are got, not by Arabian donkeys, but by a large powerful ass native to Kurdistan, one of the border provinces of Persia; a specimen of which recently procured from his home may be described as follows:

**Age:** rising five.

**General appearance:** that of a large English donkey; ponderous head; sluggish but sensible and docile face; ears like the sails of a windmill; shaggy coat; large round limbs like pillars; and if well-bred looking, only so in the sense in which cart-horses of certain strains are.

**Colour:** dark mouse, lighter on belly; with a black stripe down each shoulder.

**Height at withers:** thirteen hand (unshod).

**Girth:** fifty-eight inches.

**Under knee:** nine inches.



Temper, stolid ; sluggish at covering : friendly with horses and all animals : will not budge an inch, or even kick, if ever so much driven : but will trot briskly, and even caper, after any one offering him a carrot.

Donkeys, of which the above is a specimen, would probably answer better than the Arabian donkeys hitherto imported by the Mule-breeding Department of the Government of India. They are not to be bought, ordinarily, in Baghdad, as the white Arabian donkey of Hassa is. But they can easily be procured from the country round Kirmanshah in Persia ; and at smaller prices than the Arabian donkeys. They are of little use under saddle ; unless one were content to be carried merely like a load ; and are not fast enough to hold a place in a string of baggage mules. Their business is to take huge burdens, like heavy porters, at their own pace ; and to beget mules with as much as possible of their own size and substance, and a superior measure of nervous energy superadded. That they do so to perfection will appear from the following description of a mule now in the British Consulate General, Baghdad ; the progeny of a Kurdish donkey ; and only recently imported from the hilly country round Kirmanshah :

Age : five.

General appearance and character : very well-bred-looking ; muscular and wiry without any lumber ; sinews clean and well defined ; large well shaped hocks.

Colour : mouse ; with black streaks down shoulders.

Height at withers : 14" 2½.

Girth : 63 inches (very thin when measured).

Under knee : 7½. (Seven inches and half an inch.)

Temper : kindly, but shy with strangers. Allows any one to mount her but won't eat from hand. No vice ; but from want of early practice is difficult to load. Wants only time and encouragement to be equally good for saddle, pack, and draught purposes.

Head : bony and blood looking ; with large standing-out eyes. Very free goer, at walk, trot, and canter ; and pleasanter to ride than many a horse.

The donkey and mule above referred to were obtained through the kind offices of our Agent at Kirmanshah, Agha Hasan Sahib, direct from their breeders. The donkey cost 9 Turkish Liras (about £7 sterling), and the mule 22 Turkish Liras (about £19). Kirmanshah being only twelve days' march from Baghdad, the extra expenses were next to nothing ; while there can be no mistake as to facts about any animal procured through the medium of Agha Hasan.

Two further remarks seem worth adding. A little treatise entitled "The Mule," by Harvey Riley, Superintendent of the Government

Corral, Washington, was published at New York in 1867. If the volume be out of print, it would be well worth reprinting, and placing in the hands of every overseer in the Transport Department who can read; for it is the work of a practical man, and abounds in information. Then, could nothing be done, in a quiet way, to make Indian cultivators in suitable districts use pony mares, instead of bullocks, for drawing water from wells? All over Turkish Arabia this is the practice, and from these mares, as abovementioned, the supply of mules is largely recruited. In cost price, ponies are not dearer than bullocks. They thrive on the same rations, and get through an equal amount of work in considerably less time; while the produce of a pony mare from a good donkey-stallion would fetch, at three years old, far more than the price of the best steer. In Turkish Arabia also, bullocks abound; and a bullock, or a buffalo, is often to be seen harnessed with a pony in the same plough. But for working wells, ponies are nearly always preferred, owing to their being so much quicker in their movements.

These may seem trifles just now, with India absorbed in other matters. But as surely as time will pass, will events evolve themselves out of its progress; and, we may depend upon it, anything we can now do to widen and improve the transport resources of our Indian possessions will, in addition to its immediate effect on the material wealth of the country, stand us in good stead some day. Bad as it may be to have to import from beyond seas our remounts, it is even worse to have to do so with our transport animals.

BAGHDAD, <sup>2</sup>/<sub>3</sub> June 4th, 1883.

W. TWEEDIE, LIEUT.-COL.



## IV.

### "THE HORSES AND CAMELS OF CENTRAL ASIA."

TRANSLATED FROM THE RUSSIAN OF KOSTENKO BY W. E. G.

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#### STUDS.

(Horse-breeding in Central Asia.)

[Importance of horse-breeding to the natives of Central Asia—Breeds of horses—*Argamák*, the Uzbek breed—*Kárabairs*—The Kokhandi and Kirghiz breeds—Detailed description of the Kirghiz horse—Its training—The *Baránta*—Endurance of Kirghiz horses—Diseases most common amongst them—Importance to Russia of Kirghiz horse-breeding—Fitness of Kirghiz horses for Russian cavalry remounts—Establishment of a stud near Tashkand—Object of this stud—Prices for horses at various points of Turkistán].

HORSE-BREEDING is extraordinarily well developed in Turkistán. To the natives horses not only serve as beasts of burden but also afford them food and yield milk, out of which they prepare, amongst other things, the widely diffused and favourite beverage called *koumiss* (fermented milk of the mare). The hide too of the same animal provides them with leather. Hence the natives of Turkistán generally, and especially the nomad portion of its inhabitants, breed horses in vast numbers, but of their treatment and care they have scarcely any idea.

We have given above the number of horses in the various localities of Turkistán. The most common breeds are the *Argamák*, the *Uzbek*, the *Kárabair*, the *Kokhandi*, and the *Kirghiz*.

1. The *Argamák* or, in other words, the *Turkmán* horse comes of Arab stock. This breed is distinguished for its good proportions and comely shape. In height an *Argamák* stands four or even five *vershóks*.\* Its back is very handsome, vertebral and croup being straight as an arrow; tail well set, neck high, long and fine; head rarely large but muzzle inclined to be round; eyes large, chest narrow, legs fine with long pasterns. The pace of this breed is extraordinarily even, and this kind of horse does not know what stumbling means. The *Argamák* cannot, however, stand long marches, especially when such involve scarcity of food and other privations. Still this horse is distinguished for an unusually rapid stride, and in this respect would rival an English racer. It is quite unfit for harness work. The same breed is distributed over Turkmenia where it receives the greatest care. In Turkistán it is not very common, because the natives do not know

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\* *Sic* in original. As the *vershók* only equals 1.75 inches, the author would appear to have made some slip of the pen.—*Trans.*

how to train good horses and because the richer people only keep them at all.

2. The *Uzbek* is of somewhat smaller proportions than the preceding, and although it yields greatly to the same in point of beauty and slenderness of limb, it is vastly superior to it in respect of strength. Generally speaking, this breed resembles the ordinary horse in use by Russian peasants, and is more adapted for the saddle than for purposes of war.

3. The *Kárabair*. This breed is a cross between the *Argamák* and the Kirghiz stock. *Kárabairs* are strong and fairly well proportioned, and as a rule their legs are short, their chests broad, and their quarters powerful. They are moreover capable of great endurance, and therefore the natives put a high value on them.

4. The *Kirghiz*. This breed is the most common and best distributed throughout Turkistán. We will, therefore, speak of it in greater detail.

It would be difficult to define with exactitude the origin of the Kirghiz horse: still more difficult would it be to trace the gradual improvement or falling-off of the same stock; difficult because the Kirghiz have no sort of history of this horse. The traditions current amongst them, which are of the nature of pure fictions, do not admit of the construction of any proposition at all approaching to the truth. Nevertheless the qualities of the Kirghiz horse at least testify that it has sprung from a noble breed.

In height it does not exceed 14 hands. Kirghiz horses of 15 hands are very uncommon, and when these are met with the crossing of a larger stock is shewn to be of later date than is usually the case.

The head of a Kirghiz horse is a little large and straight in proportion to its height. If it be Roman-nosed it is but slightly so, and only in the lower part of the frontal bone, just for instance as is the case with Russian horses from the Don. The head is generally lean and expressive. It is only in the case of stallions, which the Kirghiz do not as a rule ride much, and which are almost always kept for breeding purposes, that the head is weighted with a coarse and fleshy jowl. The ears are moderately long, lean, well put on, and sometimes of very beautiful shape. The eyes too are often very fine, but in some cases a very convex arch detracts from their size and expression. Horses with an ugly or small eye are rare. The nostrils are tolerably large. The central portion of the lower lip is marked with a lump, and often when the horse is resting this will cause the lip in question to fall at least a finger's breadth below the upper one with which, whilst in movement, it is even. The neck as a rule is well proportioned, but in the case of horses of great speed it is rather long: indeed animals with too short a neck are very rare. The occiput is generally long and the head well set on. Although Kirghiz horses have a soft mouth, there are pullers amongst them. Inverse

and arched necks are met with, but they are generally light and lean. Only the entire horses have a thick neck, the coarse crest of which gives them an awkward but not a disagreeable appearance. The neck of the Kirghiz horse may, generally speaking, be said to be well put on, for it is only in certain parts of the steppe country that we find horses with too low a bearing. The withers are fairly high. Animals with low withers and forequarter are rare. The back is of moderate length: the rump small but the barrel sometimes protrudes greatly. Only those who have witnessed the sort of loads that the Kirghiz put on their small horses, and in some instances during fabulously long marches, can thoroughly estimate the strength of a back that has never known a saddle. The croup is of average length and sometimes of very good shape. Kirghiz horses with sloping quarters are rare. The chest is broad and sometimes extraordinarily so with very projecting bones, one of the distinguishing properties of the Kirghiz breed. It is also rather deep. The ribs are flat; tail and mane are long and thin; and especially so in the case of stallions roaming loose about the country. Manes may be seen that reach half-way down the forearm and tails that sweep along the ground.

But what is especially noticeable in the Kirghiz horse are the legs. The forelegs are very straight with a long shoulder and a short forearm, proportions that favour a long stride. The pasterns are short and well set; hoofs very good and firm. The Kirghiz of course never shoe their horses, and Cossacks who assemble for service with shod horses, when reaching the steppe country, find it more expedient to take the shoes off. The legs of the Kirghiz horse are, as a rule, very lean and of average thickness, extreme thinness being never the rule, and extra thickness the exception. The tendons stand well out on the fetlock. The hindlegs are, generally speaking, very straight. When curved, they are not much so. They are very well set without being turned out or clubbed. The hind quarters are broad, sometimes with very pronounced buttocks and of extraordinary strength. It is very seldom that a Kirghiz horse is seen with anything like a spavin, or indeed with any excrescence on its legs. Owing to the considerable length and comparative small size of this breed of horse, its legs seem to be somewhat short. To any eye that has not for a long time witnessed any but Kirghiz horses, the large breeds that we see, for example, in the streets of St. Petersburg and Moscow, or in cavalry regiments, seem to be long-legged and wanting in muscle. It may, however, be boldly affirmed that amongst the latter class we can never find that relative and absolute breadth which is the characteristic of very many Kirghiz horses. The general impression produced by the best of these may be thus summarized; a small and very long animal with proportionally short legs, lean but expressive head, short back and distended loins.

Speaking generally, if we except its head, and in some cases its neck, the Kirghiz horse may be called of good proportions. Its development of muscle is so great that one may confidently state in no

other breed possessed of the same lightness of movement can we find such a number of compact animals. This circumstance makes the Kirghiz steed in the highest degree capable for the performance of every possible requirement.

Having become acquainted with its exterior appearance let us now pass to its paces.

The Kirghiz horse can be much easier recognised by its movement, which is a very peculiar one, than by its exterior. We will admit that an untrained eye, especially in the winter when the animal is covered with long hair, will not recognise it from any ordinary animal of the same size that is also destitute of breeding, and yet a peculiar *tout ensemble* and lightness of movement, which is perceptible in all its paces and which is characterised by an unusual action, so soon catch the eye that even a stranger will hardly fail to notice that the animal so moving cannot be an ordinary animal, such as we everywhere see amongst the peasants of European Russia.

The walking action of the Kirghiz horse is pretty, and its pace sometimes very rapid. Eight *versts* ( $5\frac{1}{2}$  miles) per hour is not considered anything out of the way, if the animal be considered active and well broken into saddle. Ten *versts* ( $6\frac{3}{4}$  miles) per hour and upwards is reckoned very quick. All the higher officials, and many of the officers of the Turkistan military circle, have animals with the latter pace. Sometimes, instead of the ordinary walking action, the Kirghiz horse moves with a sort of amble during which the feet on the same side of the body touch the ground almost simultaneously (in every such case the animal's hind feet over reach the fore). This pace is called the *khod*. It is not so even as is the ordinary walk, but nevertheless it is much more agreeable than a sharp trot which, in the case of Kirghiz horses, however, is very soft.

The latter pace in respect of this breed is sometimes very swift. It would not be difficult to find animals which in harness would get over a *verst* ( $\frac{2}{3}$  mile) in  $2\frac{1}{2}$  minutes.

The gallop of the Kirghiz horse is likewise very easy. Although these animals are not celebrated for speed in racing they can endure labour with peculiar ease, and can, moreover, cover vast stretches of country without food, without water, and without rest. Instances, indeed, have been known where these animals have gone 100 *versts* ( $66\frac{2}{3}$  miles) without any harm.

To what we have said above we must add that all the paces of the Kirghiz horse are very true, and if their feet were not spoilt, and they were not ridden to excess, they would rarely stumble.

Amongst horses of this breed an animal with an amble (*jurga*) is very common, and a pace of this description is very swift and sometimes remarkably so. A very good ambler moves so quickly that the animal, on which a Kirghiz mounts when he wants to catch the horses

in the different runs, not being fit for racing, cannot keep up with an ambler for more than 1 or  $1\frac{1}{2}$  *versts* ( $\frac{2}{3}$  to 1 mile). If we further remark that the latter will traverse one *verst* ( $\frac{2}{3}$  mile) and more in  $1\frac{1}{2}$  minutes, it becomes clear that no trotter will compete with an ambler.

The Kirghiz are very fond of an ambler, and the price therefore which they put upon one is always high.\* Quiet though an ambler be, his rider is not always at his ease, and hence Russian officers do not care for one particularly, the more so as the belief generally prevails amongst them that an ambler is a stumbler.

The life of a Kirghiz is so bound up with the prosperity of his stud that that individual only is rich whose stud is a good one. The Kirghiz lives by his horse which brings him in profit likewise at the *baiga*.† Thanks to his horse too the nomad gets over a vast stretch of steppe and ascends the highest mountain. The Kirghiz loves not to move about on foot—a method of progress to which he resorts only in the absence of any sort of four-footed beast. If he has not a horse he will mount a camel, an ox, a cow, or it may be an eighteen months' old calf. The Kirghiz is fully aware what he owes to the horse, and exercises therefore every endeavour to improve his stud.

On account, however, of his peculiar mode of life, he succeeds in doing so but little. In the winter season, when the scanty grass of the steppe is covered over with hard frosts and deep falls of snow, the Kirghiz will search out for his horses some sheltered valley or glen, wherein the snow will admit of the animal digging out some coarse stems of grass with his hoofs. Under such conditions the richer folk will lay in for themselves a winter store of hay, but this is very rarely the case. Indeed it generally happens that those horses, which during the winter season carry their masters to the various portions of the vast steppe, have to satisfy themselves with the snow-hidden grass. The Kirghiz householder does not make the supervision of his stud his own special care; and so it often comes about that a drove of several hundred horses will be left in charge of two boys. Hence, no doubt, is the cause of that development, in the steppe, of horse-lifting, or in local phraseology the *baránta*. Properly speaking, this term amongst the Kirghiz implies the forcible removal of cattle in return for a herd that has on some occasion or another been driven away. In such cases the Kirghiz make not only that party responsible who has done the deed, but all his kith and kin as well. They will sometimes drive off a whole herd, sometimes a portion only; thus perhaps 200, 300, or even 500 horses will be removed, for the party of lifters must be a small one which is satisfied with a tenth portion of the drove. In the steppe a renowned master of the art gains by his skill amongst the people the seductive title of *batır* or *bogatır*.‡ When the Russians established themselves

\* From 100 to 400 *roubles* (£12-10 to £50).—*Author*.

† Or great national sport of Central Asia, see pages 41 and 268-269, Vol. I, Schuyler's *Turkistán*, for a detailed account thereof.—*Trans*.

‡ *i.e.*, a hero.—*Trans*.



in the steppe country *barántas* occurred but seldom, at least not nearly so frequently as formerly. Still in every district the number of horses and cattle generally that are lifted yearly is considerable. The act of *baránta* is unattended with any very cunning preliminaries. Three or four men creep up to a herd, each jump up on a horse, and then with shouts drive off as large a proportion of the herd as they can manage.

If the number of lifters be larger they will mount and approach the drove. But now begins the second and most difficult part of the *baránta*, viz., the getting away from the inevitable pursuit, since one or other of the care-takers of the drove will have certainly used every endeavour to gallop off to his *aul*, where with wild and piercing shouts of "*atan*" (mount) he will rouse all his neighbours. Every careful householder will keep both day and night, fastened to the door of his *yurta*, one or more saddled horses, an arrangement which admits of the possibility of pursuing robbers very expeditiously. Woe be to the plunderers if they once fall into the hands of the pursuers even if they do not give themselves up an easy prey. A regular fight now begins, and the whole arsenal of Kirghiz firearms is brought into play. Several fall on either side, but it must in truth be added that the lifters are but seldom overtaken in the pursuit. The raider will as a rule mount the best horse, leading another by the bridle. During the pursuit, and whilst the pace is a frantic one, he will jump from one animal to the other. This enables him to ease each horse in turn and to thus distance his pursuers who, as a general rule, have but the one horse to carry them.

It is remarkable what importance the Kirghiz attach to the weight which a horse in flight should carry. If the race be swift and protracted the rider by degrees casts forth everything possessed of the slightest weight. Indeed, sometimes he will throw off his own clothing, his shirt included, leaving but his whip, and this too perhaps he will discard, so that he may lighten his horse as much as he possibly can. If the lifted drove be not taken across the frontier line, it rarely happens that the plundered horses escape, or the thieves themselves ultimately. Unfortunately the lengthened procedure of the popular tribunal for the trial of the robbers and the award of the Judges (*bis*) are very unfair as regards the suffering party.

On the approach of an early spring the droves of horses are conducted to localities less confined than the autumn and winter quarters. Here the foaling of the mares takes place, and with this season begins the best time for the Kirghiz owner of the drove, for now he can ferment pailsful of his favourite drink, *koumiss*, which indeed at this period of the year constitutes his sole sustenance. The colt or foal remains with its dam not longer than ten days, after which period it is driven from its mother and tied with specially arranged ropes close to the *yurta*. The mares are then driven off in batches, each headed by a stallion. Every such batch is called a *Kosyák*, and

the number of mares allotted to each stallion does not exceed 15 or 20.

Three times during the 24 hours the mares are driven to the *yurtas* to be milked, and before each operation the colt or foal is allowed about a couple of minutes with its mother. All the time, however, the Kirghiz is ready to take care that only a few cups of superabundant milk falls to the lot of the suckling. Hence it is that the Kirghiz colt is very thin, and far from having that playful nature so noticeable in the colts of European Russia. The richer Kirghiz sometimes allow the colt to be with its dam during certain hours, principally at night. As soon, however, as the young one is able to munch the grass its moments with its mother are but fleeting, and they are only allowed to prevent the dam running dry altogether. To enable the colt to get any sustenance at all, grass is placed for it near the owner's *yurta*, the surroundings of which afford but scanty herbage, because the surface of the ground is nearly always worn and trodden down.

The colt is ridden at an extraordinarily early age, and before its bones are set, *viz.*, in the second year. This is no doubt one of the causes of the small size of the Kirghiz horse, the more noticeable from the fact that the mares, which the Kirghiz seldom ride, excel in this respect either the geldings or the entire horses. The Kirghiz maintain, however, that if they did not begin to ride their colts thus early, they would not be approachable at the age of three or four.

During the spring and summer Kirghiz horses become so fat and improve to such a degree as to become unrecognizable.

This is especially the case with horses that are ridden to the mountains. Amongst the Kirghiz who roam on the higher lands the horses are distinguished by their better condition, the beauty of their form, their powers and capability for lengthened journeys. Such animals freely cross terrible and rocky summits, during the progress over which the rider will sit with peculiar skill as though his steed was going over the most even ground, and did not occasion him the very slightest jostling or uneasy movement of any kind. On mountain paths fissures about  $2\frac{1}{2}$  feet wide, and even more, are often met with; these are flanked by a yawning precipice whilst the track itself is very narrow. To the Kirghiz horse the obstacle is of the most ordinary description, for he will carry his rider across it with such lightness as scarcely to shake him in the least. The aptitude too with which an animal of the same breed can cross a rapid mountain torrent constitutes a priceless quality of the stock. In defiles, and sometimes in valleys, such streams are encountered which, though but two feet in depth, will carry any man off his legs. These the Kirghiz horse will cross, nay channels of greater depth, even say to  $3\frac{1}{2}$  feet, will not stop this surprising animal. For be it remembered the bottom of such streams generally consists of huge smooth boulders over which it is difficult to move,

not merely when the velocity of the water has lessened but when the bed is altogether dry.

In consequence then of the light movement of the Kirghiz horse, its indifference as regards any particular food and its unusual powers of endurance—the results of a good constitution and severe training—this animal is simply priceless for rapid movements over desert and waterless steppes where it often happens too that green fodder does not exist. A good Kirghiz horse is so unwearying that 100 *versts* ( $66\frac{2}{3}$  miles) can be traversed daily for six, seven, or even ten days in succession.

Between Peter-Alexander\* and Kázalinsk\* there is no post road, correspondence being maintained through the medium of *chabars* (mounted messengers). Kirghiz are hired monthly for the purpose and receive 25 *roubles* (£3-2-6), providing their own horses. They are obliged to carry the post in eight days. By the map the distance between the points named is about 500 *versts* ( $333\frac{1}{3}$  miles), but roads which should go perfectly straight do not exist, hence the nearest way involves a distance of at least 550 *versts* ( $366\frac{2}{3}$  miles). Moreover the Kirghiz seldom adhere to the most direct route but make long détours for the purpose of visiting the sparsely scattered *auls* in this neighbourhood and their acquaintances, with whom a rest and a good meal await them. Almost the whole of the route in question lies along shifting sands, and on it is a waterless stretch, extending for 130 *versts* ( $86\frac{2}{3}$  miles); and if the fact be taken into consideration that in the well furthest away from the Amu-Daria there is often no water, the whole journey may be held to be a great undertaking. To complete the picture let us add (1) that the Kirghiz horses in question are poor and emaciated in consequence of the extreme poverty of the pasture that they get; (2) that they carry along this steppe not a light but a very large load. Of green fodder along the route indicated there is none, so that it is necessary to carry on and for the horse from  $1\frac{1}{2}$  to 2 *puds* (54 to 72 lbs.) of barley besides the necessary food for the rider, the more so because *auls* are not met with in more than two or three places during the journey. In winter too a felt covering must also be carried to put over the horse on coming to a halt, besides a proper store of clothing for the rider to prevent his being frozen on the setting in of a sharp frost or the bursting of a storm. If in addition to all this we further include the rider's fire-arms, the nose-bag and the vessel for drawing water from the wells, besides numerous smaller articles that are necessary in a desert country, we may boldly affirm that the lightest load on the horse will never be less than 8 *puds* (288 lbs). It follows, of course, that the *chabars* are sometimes behind time, but such instances are rare, and then the horses are not in fault.

Russian merchants do the same distance in five days and even less, but then, of course, their horses are better, having to carry far greater loads than do those of the mounted messengers of which we have just

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\* Fortified points on the Amu-Daria and Sir-Daria respectively. Kázalinsk is also known as Fort No. 1.—*Trans.*

been speaking. For instance, no Russian merchant ever rides a journey without carrying his copper or brass tea-urn (*samovár*), pails, &c., &c. If there be a spare horse there will only be one amongst several men, and the poor animal will be loaded as much as possible.

Between Khiva and Bokhára, a distance of 450 *versts* (300 miles) the journey is performed in a time not exceeding four days, 200 *versts* (133½ miles) of the route lying over loose sand and very uneven ground that constantly dips and ascends over high sand drifts (*barkháns*). On this route the loads are even heavier than on the one previously described, because here no one can travel without a large supply of water, if we except those occasions on which the journey is performed with fabulous speed, the stock of water being then confined to a small leathern bag (*tursuk*) attached to the saddle bow.

Between Petro-Pavlovsk\* and the town of Turkistán,\* a distance of 1,500 *versts* (1,000 miles), the agents of the various trading houses, who are for the most part Tatars, ride in three weeks, sometimes a good deal less. Along this route regular supplies of forage can only be reckoned on for about half the distance, *i.e.*, as far as Fort Ulutavskoye†. Beyond this point *djuzán* (*polin* or absinthe) alone grows, and even this very sparsely, in places there being no sort of vegetation. To carry corn for such a long journey would not be possible, and so every endeavour is made to travel as lightly as possible. Very curious information as to how a Kirghiz horse behaves under variable circumstances can be found in an interesting article by Mons. Vogak‡.

In the autumn of 1869, during the insurrection on the Orenburgh steppe, a detachment under Mons. Vogak himself, consisting of two Orenburgh *sotnias*, 120 riflemen, mounted on Kirghiz horses, one three-pounder gun and two rocket stands, traversed in the course of a month about 1,500 *versts* (1,000 miles) and only lost three horses. It must not be forgotten that about half this march lay over deep sand (the Greater Bársuks in the neighbourhood of the Sea of Aral).

The Cossack leader Bobroff, who was in pursuit of some raiders, frequently rode with his Cossacks, from 120 to 150 *versts* (80 to 100 miles) in the 24 hours. They would in many cases return the same distance to the Fort the next day, and on the first rumour of the re-appearance of the freebooters would again gallop off in pursuit.

The following is a striking instance of the rapidity with which one or more horsemen can get over a distance of from 150 to 250 *versts* (100 to 166½ miles). In May 1869 Mons. Vogak, accompanied by an interpreter and two Kirghiz, rode from Kára-Butak§ to Irgiz,§ in a

\* In the province of Akmolinsk and Sir-Daria respectively.—*Trans.*

† This point does not appear on the Russian map of 1877, but Arrowsmith's map gives it. The latter, notwithstanding its small size, may be said to be the *only* good English map of Central Asia in existence.—*Trans.*

‡ Vide *Voyenni Sbornik* No. 9 for 1873.—*Author.*

§ Both fortified points in the province of Turgai; the latter is also called Fort Ural.—*Trans.*

direct line 160 *versts* (106 $\frac{3}{4}$  miles), in less than 12 hours. The horses and saddles belonged to Kirghiz and the animals in no way suffered from this rapid ride.

In October of the same year, Mons. Vogak left his detachment to come on by regular marches along the Greater Bársuk sands and rode on to Irgiz, attended by 30 Cossacks as a guard. Half way he left his escort because he wished to spare their horses that might otherwise have suffered on account of the ceaseless pursuits after freebooters. He himself rode one horse into Irgiz, a distance of 250 *versts* (166 $\frac{3}{4}$  miles) in 34 hours.

Rides by the Kirghiz themselves, always on two horses, are still more striking.

For instance, in April 1869 a Kirghiz, who had been sent by Mons. Vogak with a packet of letters from the natural boundary of Aral-Chil (which lies to the north of the Greater Bársuk sands) returned in 37 hours, having ridden his two horses 400 *versts* (266 $\frac{3}{4}$  miles) in that time. Messengers, sent by Colonel Count Borch, commanding a detachment, from Djebeske, came to Orenburgh in six days and took back an answer in 14 days, during which time they had ridden 900 *versts* (600 miles).

As another instance of a peculiarly rapid ride, I will adduce the following: After the fight on the heights of Chupán-Ata before Sámárkand in 1868 a *jigit* (mounted messenger or sort of militia man) was sent to Táshkand, where he arrived in 24 hours having ridden one horse, a stallion of four or five years, 280 *versts* (186 $\frac{3}{4}$  miles).\*

Notwithstanding their strength and power of endurance, Kirghiz horses are nevertheless subject to various ailments occasioned by causes above indicated. Siberian plague or *yázva* likewise destroys not a few. The latter disease is cured by one very expeditious method; the horses thus affected are kept standing in water up to the belly for a lengthened period, during which food is only given to them at night and then heated salt is mixed with it.

Of other diseases the following are the most frequent:—

*Parsh* or itch, a disease which is peculiar to steppe horses. It appears as a rule after the winter emaciation. A horse afflicted with it is rubbed over either with tar or salt and kept apart from the drove until the scabs have dried.

*Nógot* (*ul*) or horny excrescences, which are cured by bleeding the ear. Blood-letting from the several parts of the body is mostly practised by those who do not understand the diseases of the equine race.

*Manam*, a suspicious looking sort of flux. Besides a discharge of pus from the eyes and nostrils, subcutaneous ulcers not unfrequently show themselves. In the latter case the disease bears the name of *chilchige*, but even if unattended by the latter complication it is held to

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\* At the rate of about 7 $\frac{3}{4}$  miles per hour.—*Trans.*

be incurable, although certain Kirghiz do endeavour to keep up the horse's strength by pouring *koumiss* into its nostrils.

Glanders are likewise treated by pouring *koumiss* into the horse's nostrils and by puncturing the muscles of the breast in various places.

*Jamandat* is a disease which the Kirghiz hold to be one of the most dangerous. Its signs are tumours in the chest which, if they reach the windpipe, cause the animal's death. On the appearance of swellings the place is at once lanced, but if after this operation the swelling is seen to extend upwards, further treatment is deemed useless, and the horse is killed and eaten.

It is remarkable that hoof diseases are almost unknown amongst Kirghiz horses. This is, perhaps, explained by the fact that the Kirghiz do not shoe their horses either in the plains or in the mountains. Hence the hoof of a Kirghiz horse is remarkable for its unusual hardness. One of these animals will go for hundreds of *verst*s over rocky mountains and valleys covered with pebbles, and yet its hoofs will not be in the least injured. Perhaps it is because of the quality of its hoof that the Kirghiz horse is of such extraordinary value, and really one cannot be surprised at this when one sometimes beholds some Kirghiz valiant, weighing from 7 to 8 *puds*,\* getting his horse to clamber over high rocks forming an angle of 30 degrees and maintaining this incline it may be for several *verst*s. We have ourselves happened to see tracks having the appearance of being worn by the passage of chamois or *marál* freely and easily traversed by Kirghiz, who call such "*kára-jol*" or the "highway."

They must have great presence of mind and confidence in their horses to go over places that for the most part lie along a narrow rocky cornice, on the one side of which is the overhanging crag and on the other a precipice. And yet in spite of all this, occasions of misfortune in such passages are of the rarest occurrence. The rider then thoroughly trusts his horse, and the best will throw down his reins preferring that his horse and not he should select the proper road.

Kirghiz horse-doctors have from of old been celebrated for their great knowledge and skill in operating on horses—operations which they effect entirely with the aid of an ordinary knife attached to their girdle called a *psiak*.

Many diseases, such as diarrhoea, piles, windgall, &c., the Kirghiz consider so unimportant that they do not treat them at all. The castration of entire horses is carried out in the most negligent manner, in consequence of which the percentage of mortality is a high one. In the operation, which takes place generally at the age of 2, the Kirghiz use only a twist, cinders and the *psiak* above mentioned. After it is over the animal is driven straight off to join the drove.

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\* This, and indeed the whole statement, must be exaggerated for since a *pud* equals 36 English lbs., the author would have us believe that the "valiant" spoken of weighs from 18 to 20 stone.—*Trans.*

Although the sport called *baiga* amongst the Kirghiz is not designed for the trial of the respective qualities of their horses, under a certain stage of the development of the business of horse-breeding, the custom might receive another bent more intelligible and useful. Amongst the Kirghiz the *baiga* is a great affair. The birth of an infant is celebrated by it; in it the memory of a departed relative is honoured; it awaits too the arrival of a distinguished guest. The more important and wealthier the Kirghiz who institutes a *baiga*, the more considerable are the prizes and the larger the number of the competitors. But however modest be its proportions a vast mass of spectators will always come to witness it, perhaps 1,500 or 2,000, and of these the greater part will come from afar, it may be 300 or 400 *vershs* (200 to 266 $\frac{2}{3}$  miles). But of course the larger number will only come a long distance, when the *baiga* is a rich one, *i.e.*, when the number invited is a large one and the prizes numerous and of value. On the occasion of a grand gathering the value of these prizes will sometimes amount to several thousand *roubles*.\*

In the training of a horse for a *baiga*, the Kirghiz hold that the animal should be relieved of all superfluous *internal* fat that otherwise would press on the lungs and hinder the free breathing of the animal. They at the same time endeavour to make the whole body of the horse lighter and to give it a greater amount of strength.

Amongst the Kirghiz, as everywhere else, the training of a horse for racing consists in trying its paces and regulating its food; but this process with them is otherwise and more simply conducted than on the flat. The preparation of a horse for the *baiga* begins about two months and never less than four weeks beforehand. The longer the distance to be run over the more protracted is the period of the horse's training. But some Kirghiz are of opinion that the horse is ready to take part in the trial when its sweat loses its salt taste and becomes like water.

*Baigas* as a rule take place during the summer or winter, prior to which the horse ceases to be let out to graze and is given from one to two wooden cupfuls of barley (weighing about a *garnet*=0.34 peck.) With this allowance it gets at first a little dry grass, the amount of which is reduced little by little, and altogether stops within a period of from four to five days of the great event. The horse is now fastened to a long cord stretched between two stakes in such a way that, though it can move freely from one stake to the other, it cannot munch any grass. The fastening is always made where there is grass, so that the animal in its desire to get it shall always keep on the move. Endeavour is made also to deprive the horse of water, and as a substitute they give it the

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\* Thus at one of these *baigas* which we attended the first prize consisted of 100 camels, 100 horses, 100 cows, 100 sheep, 100 *roubles* (£12-10-0), 100 *kokandis* (about £2-5-0), 100 *arshins* cloth, 100 *arshins* of a material called *shai* or *hanaus*, and 100 pieces of *mata*.

The second prize is usually of considerably less value, and may consist of two or three horses. Such an infinite difference between the first and second awards induces all to struggle for supremacy.—*Author*.

fresh or the fermented milk of the mare. At first the poor beast will not take it, but at last its thirst is so great that it accepts readily, whereupon its Kirghiz master looks the more eagerly for success in the race.

In the opinion of the Kirghiz, the horse acquires through the medium of the milk that strength without which they could not take it to the course, because the distance to be traversed is great, extending sometimes to 80 *versts* (53½ miles). The riders are generally small boys of not more than 10 or 12. There are some remarkably good riders, too amongst them, who would do honor to any European race-course. These Kirghiz striplings are in no way trained, and when they get down from the horse after a gallop of some 50 *versts* (33½ miles), they do it as jauntily as though they had not ridden more than ½ *verst* (¼ mile)\* Prior to the commencement of the race, all the horses competing are collected at a given point, where a large concourse of Kirghiz awaits them. The horses have to reach a given point and then race back. During the race to the place indicated, umpires attend the competitors, and it is their business to see that each one fails not to go up to that point and to traverse exactly the same distance as the others. High ground is usually selected for the judge's box, whence a good and extensive view can be gained of the road leading back to the goal. When it is thought that the competing horses are on their way back to the goal or prize-stake, there go forth those interested in the race, several men devoting themselves to each of the running horses which they rush to drag in, in case it may grow weak just as it draws near to the goal. As they await the return of the horses from the *baiga*, the Kirghiz have lotteries amongst themselves, each prize consisting as a rule of an *arshin* (28 inches) of chintz. At last a cloud of dust appears in the distance, the crowd gets thicker, and several horses are seen coming up at a fast gallop. Those Kirghiz who are nearest to the course rush forward to their respective favourites, and seizing them by the tail and mane begin to drag them forward, thus trying to make the jaded animals move, if possible, the faster. The leader is mercilessly beaten by his backers, until at last he reaches the goal amidst a perfect throng of Kirghiz. Of course under such circumstances the conscientious judges find it difficult to decide in what order the horses have arrived, and hence, in the awarding of the prizes, a most frightful wrangle generally ensues, which often ends in blows. One of the principal reasons for appointing a long distance for the *baiga* is that the horses may not come up to the goal at one and the same time, for the longer the course the easier is it to determine the order of the competing horses.

When the *baiga* is over the horses are unsaddled and unbridled. Any animal that is to take part in another race is given a little grass during the space of two or three days to make it fresh, and then it again under-

\* These boys always race without caps, the head being fastened round with a cloth, bound very tightly. At first the pace is not severe, an easy gallop or perhaps a trot, but on returning towards the goal they let their horse out, especially as it draws near.  
—*Author*.



goes the training that we have described above. In any case, after a race of unusual length, the horse is kept standing without food or drink for at least 24 hours, and if it be very tired even more, for the Kirghiz are convinced that the best way of bringing a horse round after excessive work is a lengthened period in the standing position. Even after an ordinary quiet ride 10 or 12 *versts* ( $6\frac{2}{3}$  to 8 miles), a Kirghiz will make his horse stand for at least 10 or 12 hours, principally at night.

The Kirghiz never trot their horses on the steppe, the invariable pace being a quick firm pace which enables the horse to move at the rate of from 6 to 7 *versts* (4 to  $4\frac{2}{3}$  miles) per hour. Hence a Kirghiz horse is never tired by a ride of from 20 to even 30 *versts* ( $13\frac{1}{3}$  to 20 miles). Nevertheless a very lengthened stand is in such instances considered necessary.

Regarding the swiftness of the stride of Kirghiz horses we will here give some details borrowed from an article by Mons. Garder in the *Voyenni Sbornik* for 1875.

Amongst the Inner Kirghiz Horde races for prizes were instituted by the Minister of State Domains beginning with the year 1851. On the  $\frac{22\text{nd September}}{4\text{th October}}$  of the same year a circular course, measuring 6 *versts* (4 miles), was made, and round this the horses had to go five times. The horse which carried off the prize did the 30 *versts*'s (20 miles) distance in 48 minutes and 45 seconds, giving an average of 1 minute 37 seconds to a *verst* ( $\frac{2}{3}$  mile).

Commencing with 1853 the races were held thrice, twice and once a year respectively, but always over a circular course, measuring 20 *versts* ( $13\frac{1}{3}$  miles). Of these races we have only detailed information from the year 1869.

The greatest speed was recorded on the  $\frac{20\text{th September}}{2\text{nd October}}$  1853, when the horse which took the prize did the 20 *versts* ( $13\frac{1}{3}$  miles) in 27 minutes and 30 seconds, or one *verst* in 1 minute and 22 seconds.

The lowest rate of speed, on the other hand, was displayed on the  $\frac{18\text{th}}{30\text{th}}$  May, viz., 20 *versts* ( $13\frac{1}{3}$  miles), in 39 minutes and 30 seconds, or one *verst* in 1 minute and 58 seconds.

The Chief Administration of the State Studs did not credit the information sent from the Horde, so that in 1856 there was sent to the sitting committee a second metre, requesting that the speed might be followed on it, the circumference of the circle having been previously measured. The President of the committee reported that the measurement of the course was correct, except that in every 4 *versts* ( $2\frac{2}{3}$  miles) it was out  $17\frac{1}{2}$  feet. The deficiency was then made good. Accordingly on the  $\frac{20\text{th September}}{2\text{nd October}}$ , a trail was held, at which the speed was checked with the aid of the second metre that had been forwarded and several watches with seconds hands. These showed a speed of 20 *versts* ( $13\frac{1}{3}$  miles) in 31 minutes, or 1 *verst* ( $\frac{2}{3}$  miles) in 1 minute and 33 seconds.

All the races over a course of 20 *versts* ( $13\frac{1}{2}$  miles), of which we have particulars, number 19. The average time in which the Kirghiz racers got over this distance was 33 minutes and 40 seconds, or one *verst* ( $\frac{2}{3}$  mile) in 1 minute and 41 seconds.

In 1861 a race was held over another circular course measuring about  $3\frac{1}{2}$  miles. Round this the race was five times. The mare that won performed the distance (about  $17\frac{1}{2}$  miles) in 48 minutes and 45 seconds, or  $\frac{2}{3}$  mile in 1 minute and 51 seconds.

On <sup>26th September</sup><sub>8th October</sub> 1863 the descendants of Khán Jehángir constructed a circular course on their estate on the river Torguna, which measured about 23 *versts* (about  $15\frac{1}{2}$  miles). This course still exists and is marked with a ditch and bank. The distance over this was performed in 42 minutes and 20 seconds, or one *verst* ( $\frac{2}{3}$  mile) in 1 minute and 50 seconds.

For the race of <sup>21st May</sup><sub>2nd June</sub> 1861 they weighed the riders and found that their weights ranged between four and six stone.

Races over a circular course of more than 20 *versts* ( $13\frac{1}{2}$  miles) have not taken place. In the Kálmak *uluses* (groups of nomad tents) of the Astrakhán Government, races over 15 *versts* (10 miles) have been held.

The greatest speed over this distance was recorded in 1864, *viz.*, 23 minutes and 56 seconds, or one *verst* ( $\frac{2}{3}$  mile) in 1 minute and 35 seconds.

The lowest rate of speed over the same course was in 1864, *viz.*, 27 minutes or one *verst* ( $\frac{2}{3}$  mile) in 1 minute and 48 seconds.

The time recorded between 1862 and 1865 and 1867 and 1869 was 25 minutes and 15 seconds, or one *verst* ( $\frac{2}{3}$  mile) in 1 minute and 41 seconds.

It is not possible to compare a 15 *verst* (10-mile) course with a 20 *verst* ( $13\frac{1}{2}$  mile) course, because the pace throughout, and especially towards the end, is different. But even if we were to essay such a comparison, the pre-eminence would be with the Kirghiz horses, since the highest rate of speed of the latter animals was 1 minute and 22 seconds, and of the Kálmak horse, 1 minute and 35 seconds, whilst the lowest rate of speed of the former was inferior to that of the latter, the figures being as follows: 1 minute and 58 seconds and 1 minute 41 seconds respectively. Their averages are thus shewn: Kirghiz, 1 minute and 41 seconds; Kálmak, 1 minute and  $41\frac{1}{2}$  seconds.

Russia, as regards her supply of horses, is remarkably well off. The southern steppes of New Russia were at one time more productive of horse-flesh, so that our cavalry never wanted remounts of the best kinds. But now, unfortunately, the once inexhaustible supply of horses has begun to run dry, and that at a very rapid rate.

It would be worth while to trace these particulars out for the last

10 or 12 years when the swift economic development of Russia made it almost impossible to breed such a noble, and in some cases ignoble, animal as the horse, in the sense that is of a regular and well-considered item of rural industry. The development of railroads has had a still more destructive influence on the breed of Russian horses, as, apart from the fact that the iron road diverts all the economic forces to other more favourable localities, it, by its very property, renders the horse unnecessary as a motive agent, and hence the demand for horses lessens with the increase to the number of railroads, so that the breeding of this useful animal cannot but be restricted.

It is known that in Russia studs have never been paying concerns, at least the exceptions have been very rare. Prior to the emancipation of the serfs a stud-owner had at his command a large number of unpaid employés, but even then horse-breeding was almost the same exclusive passion (though perhaps a more noble one) as the fancy for keeping up packs of sporting dogs. In any case economy scarcely ever entered into the question of horse-breeding. The most prosperous studs were those which were made the medium for the sale of all its produce, including oats and hay, the market for which was in certain localities almost closed; and since these articles were the products of enforced labour the stud-owner, when he sold his horses, sold with them the unpaid labour of his own peasants. In such a case any price was advantageous to the owner which he might receive and even that which he got for supplying cavalry remounts. The question he kept before himself was how to produce the largest number of horses and to make their number indemnify him for the smallest expenditure. But besides all this a stud requires a number of employés to take care of the horses, and an owner could have as many as he pleased, of course without paying any of them anything. Now-a-days cheap production of remounts is in Russia almost an illusion, and this because now every, even the most infinitesimal labour, must be paid for. Stud servants are moreover very expensive to maintain, so that if we calculate all the items of expenditure in a stud and divide these by the number of four-year olds got ready for the market, we shall find that each horse will cost the breeder not less than 300 *roubles* (£37-10-0), i.e., if we leave out of the account rejected and undersized animals which are sold for a trifling sum. The remount price for the horses of the Russian Cavalry of the Guard (Cuirassier regiments excepted) has been fixed at 203 *roubles* (£25-7-6), and for those of the Cavalry of the Line at 125 *roubles*\* (£15-12-6). These prices include the bringing the remounts from the stud to the particular regiment—an arrangement which must involve a very considerable sum. Thus many of the remounts for the Russian Cavalry

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\* The Cavalry of the Guard, His Majesty's Horse, and Cuirassier Regiments, have horses priced at 235 *roubles* (£27-7-6). The Empress's Cuirassiers are mounted for 207 *roubles* (£25-17-6) per man, and all the other Guard regiments for 203 *roubles* (£25-7-6). The price fixed for the Cavalry of the Line, viz., 125 *roubles* (£15-12-6) has only obtained of late. Formerly it was from 60 to 85 *roubles* (£7-10-0 to £10-12-6) according to the distance of the dépôt from the place of sale, &c.—*Author*.

of the Guard have to be brought from the south of Little Russia to St. Petersburg. For the railway alone from Moscow to St. Petersburg the charge is 16 *roubles* (£2 per head). Although the original price paid for the remounts of the Russian Cavalry of the Line is not nearly so high, being almost half, expenses attending transport cannot but be very considerable. These questions then come to be asked—How much is the most conscientious remount agent able to pay the breeder? Can he give him any percentage at all in return for his wasted capital, and can he reimburse him for one such loss? From this we shall see that the condition of studs in Russia has become a very difficult one, and that in spite of all the encouraging measures of the Chief Administration for State horse-breeding, this important branch of state economy can scarcely be maintained.

It was only in 1864, at the Ilin fair held in the town of Poltava that the late General Aide-de-Camp Grinwald expressed himself in a statement of remarkable truth concerning the southern regions of Russia that were at one time so rich in horses, to the effect that “the sheep is everywhere driving out the horse.” We must not forget that this remark applied to a time when communications were far from having the development that they now have, and consequently many other productive agencies had not received the tendency that subsequent events have perforce given them. So it has now come to pass that horse-breeding is only practicable for wealthy folk, an *article de luxe*, a destructive passion or hobby. In our day then there are not many fanciers who can make up their minds to sacrifice hard-gotten gains out of love of horse-flesh. The breeding of trotters and racers (thoroughbreds) is subject to the same conditions, but we are here speaking solely of the remount class of horse.

In truth we still have in Russia a vast source of supply for our cavalry remounts, *viz.*, the country of the Don, which, were the question taken up, could, in the not distant future, be made capable of producing a cheap breed of horse for the purpose in question. But we have indeed full ground for the belief that the Don will soon in this respect share the fate of Southern Russia, and that in this tract horse-breeding will on an early date be driven out by all other branches of rural industry.

In view then of such a state of affairs for Russia there still remains a vast source of supply for her cavalry remounts, *viz.*, the Kirghiz steppe.

Kirghiz horses need not be subjected to trials before being admitted into the Russian army, because an honoured place therein belongs to them of right, and this they will assume of themselves. We should not forget that on these horses Kokand, Bokhára and Khiva have been subdued and pacified. On them served throughout Central Asia, our cavalry, artillery, our officials, and our officers; that not one single movement has taken place in the same country without preliminary

information brought on these horses travelling on some occasions a distance of 200 *versts* ( $133\frac{1}{2}$  miles) in the 24 hours: that, finally, all the hard fought campaigns which have gained for Russia sovereignty in Central Asia have been carried out, without exception, with the aid of these horses.

If Kirghiz horses are suitable for cavalry they are not the less so for artillery, since they are both light and compact, broad of beam, very skilful and well adapted for purposes of heavy draught. So for artillery, and especially for the horse branch of that arm, which should in war time be the very shadow of the cavalry, heavy horses are decidedly unfit, those being required which with unweariedness and lightness of movement is coupled considerable power of draught. It may be permitted us to remark that Kirghiz horses can be said to be the very ideal of artillery remounts, especially if we add that they are quiet, very intelligent, and soon grow accustomed to firing of all kinds.

Kirghiz horses too would be specially useful in bringing up cavalry and artillery remounts to a war scale.

And animals of this breed would moreover involve another advantage, *viz.*, a large and ready supply of trained animals, and of animals so well trained that any indifferent rider could, when mounted thereon, execute evolutions in the capacity of only a few, and those the most skilful riders of the present horses of the Russian regular cavalry. Every good horse which a Kirghiz rides is surprisingly skilful, active, teachable and obedient. This being the case, horses of this breed could at once be passed into the ranks of cavalry on active service—an advantage of which the adoption of no other breed of horse will put us in possession.

In proportion as buying of such horses were carried on, the prices demanded for them by Kirghiz nomads would no doubt rise, but the supply of such would not fail, because without saddle-horses the Kirghiz cannot continue their nomad style of living.

Thus these nomads would in time of war render us service of no slight importance, thus unconsciously taking upon themselves the performance of the *rôle* of reserve squadrons, from which, under present circumstances and even in peace-time, horses after a period of more than ten months pass into different regiments in the shape of stupid, coarse, intractable animals, in a word thoroughly unbroken steeds. These the best riders of a regiment, under a non-commissioned officer, are engaged in breaking in during a whole winter, and though this is the case even at the beginning of the third year of their service, they are still called young or recently received horses, from which regular and masterly exercise cannot be required.

There is one other good quality which incontestibly belongs to Kirghiz horses, and one that has been observed by many of those persons who have had to do with this breed of horse. This is, that when

wild or afraid of the presence of man they are obstinate, strain at the rein in their endeavours to push forward, and during these attempts, although they may fall, they scarcely ever kick. So from all that we have said it is clear that there is no sort of obstacle in the way of admitting Kirghiz horses into our cavalry and artillery services, the more so because of their superiority over horses used in both these arms at the present day, Kirghiz horses being at once cheaper, incomparably more enduring and stronger, possessed of excellent paces, a quality so rarely met with in European horses. They would serve too longer because they are much more docile. All these superiorities Kirghiz horses possess, not only over the present Russian remounts, but over all other steppe breeds yet introduced into the Russian army.

We will hope then that animals of this breed which have rendered such service to our armies will at length draw to themselves just attention, and interest other than mere fanciers. We have shewn that in the event of war Kirghiz horses would be of great service to the State, because the Kirghiz stud, as sources of supply, present such advantages as could not possibly be expected of the studs and droves of European Russia. The sole defect of the Kirghiz horse, its small size, could be easily removed in the first generation by crossing the breed with a larger one possessed of like properties, or, as they say in horse-breeding parlance, by adding a good strain. This is the reason why the establishment of studs in Turkistán is so desirable.

On the basis of what has been said, the endeavours of the Turkistan Administration have been directed to co-operating in the improvement of native horse-breeding. To this end, in 1871, a stud was established at Kaplán-Bek, 25 *vershs* ( $16\frac{2}{3}$  miles) from Táshkand, near the Chimkand road.

This stud was started by a company aided by the State.

The following was its condition in 1876 :—

|                                   |                                     |     |     |     |
|-----------------------------------|-------------------------------------|-----|-----|-----|
| Covering stallions ...            | ...                                 | ... | ... | 17  |
| 1873                              | Entire horses not used for covering | ... | ... | 43  |
| 1874                              | "                                   | "   | ... | 36  |
| 1875                              | "                                   | "   | ... | 31  |
| From Kokand stallions, 1874 ...   | ...                                 | ... | ... | 1   |
| " " 1875 ...                      | ...                                 | ... | ... | 3   |
|                                   |                                     |     |     | 131 |
| Geldings                          |                                     |     |     | 23  |
| TOTAL                             |                                     |     |     | 154 |
| Brood Mares ...                   | ...                                 | ... | ... | 139 |
| Mares not used for breeding, 1872 | ...                                 | ... | ... | 4   |
| " " 1873                          | ...                                 | ... | ... | 33  |
| " " 1874                          | ...                                 | ... | ... | 29  |
| " " 1875                          | ...                                 | ... | ... | 25  |
| Rejected                          |                                     |     |     | 7   |
| TOTAL                             |                                     |     |     | 237 |

## FROM KOKAND—

|                                  |     |     |     |     |
|----------------------------------|-----|-----|-----|-----|
| Mares, old, but fit for breeding | ... | ... | ... | 8   |
| " " 1873                         | ... | ... | ... | 5   |
| " " 1874                         | ... | ... | ... | 5   |
| " " 1875                         | ... | ... | ... | 2   |
| TOTAL                            |     |     |     | 257 |

The mares for the stud were bought of Kára-Kirghiz in the Aulie-Ata district, animals from this district being considered the best of the Kirghiz breeds. There is not a doubt that this stock has sprung from known Torgout horses, as the Kára-Kirghiz have long had near relations (peaceful and hostile) with the Torgouts.

There are but few valuable and good horses in Táshkand. Here a horse exceeding 200 *roubles* (£25) in value is a rarity, and can only be got by accident or the medium of jobbers. In the bazaars horses above the value of from 40 to 80 *roubles* (£5 to £10) are not sold. The best horses come from Sámarkand, Ura-Tabe, Bokhára, Kokand, and the Aulie-Ata district. Fair animals too come from Sairám, the town of Aulie-Ata, and other places. The prices of horses vary not only in respect of particular localities, but even in one and the same place according to the time of year and other causes. But the time of year has most to say to these fluctuations, when forage is wanting or at least when it is very dear, as in winter and spring prices fall to rise again in summer and the autumn. In Táshkand a good horse may be bought for from 40 to 50 *roubles* (£5 to £6-5-0): in Kokand for from 35 to 40 *roubles* (£4-7-6 to £5.)

A Kirghiz horse is priced at about 50 *roubles* (£6-5-0). Amblers are an exception, their prices on the steppe being high.

The most ordinary price of an ambler will be 100 *roubles* (£12-10-0), and sometimes it will be as much as from 300 to 400 *roubles* (£37-10-0 to £50.)

The dearest horse of all is the Turkmán or *Argamák*.

The lowest price for this breed will be 200 *roubles* (£25), but 300, 400 and 450 *roubles* (£37-10-0, £50, and £56-5-0) is a common demand. But for the reason given in the beginning of this chapter the number of Turkmán horses in Turkistán is very limited.

The following newspaper cutting is interesting as showing the relative resources of the six great powers of Europe in respect of cavalry remounts:—

"Austro-Hungary is said to possess 3,569,000 horses, Germany 3,352,000, France 3,000,000, Great Britain 2,790,000, and Italy 657,000; while in the Kirghiz steppes alone Russia possesses 4,000,000 riding horses. The excellent qualities of the Kirghiz horse have led to a proposal to use it for cavalry remounts. The provincial studs, especially those of the Don, are in decadence; the price of horses is consequently rising, and the difficulty of procuring remounts is continually increasing. Sooner or later Russia must fall back on the studs of the steppes. The Kirghiz horses constitute a precious and abundant reserve. Most of these horses are small, intelligent, docile, of great

speed, indefatigable, and very temperate—qualities which make them suitable for military service. The best are those belonging to the steppes of Orenburg and Turkistan; but only half of them are available for regular cavalry, the others being too small. It is also doubtful whether these horses, used to a dry, hot climate and the herbage of the steppes, could bear the damp which prevails in the greater part of Western Russia."

#### CAMELS AND THEIR IMPORTANCE IN A MILITARY-ECONOMIC SENSE.

[Importance of camels to the natives and to the Russian troops—Investigation of the method of obtaining them for military purposes during a campaign—Question as to a permanent camel train kept up for army purposes—Lieutenant-General Ivanin's opinion on this subject—Permanent camel train with the French Army in Algeria—Impossibility of maintaining a permanent system of transport with the Russian forces in Turkistan—Various methods for the supply of camels for the Russian troops during steppe campaigns and the rates chargeable for such—Breed of camels in Turkistan—Camel-breeding among the natives—Descriptions of camel—Diseases of camels and their treatment—Camel's flesh and milk—Prices of camels.]

In Turkistan camels have a great importance, both with respect to the native inhabitants and the Russian troops. Amongst the nomads the same animal serves as a trustworthy medium of transport in all peregrinations during which every article in domestic use is packed thereon. Camel's flesh, too, however tough it may be, is used for food. The hair of the same useful beast is used in the preparation of *Armydchina*, felts, in place of wadding or the quilted lining of coverlets, and in the manufacture of lassos and cords of every kind. The settled inhabitants could not get on without camels for the transport of their wares over long distances along waterless and infertile wastes. It has long been the custom in Central Asia for trade caravans to be furnished with camel carriage, and this the settlers mostly get from the nomad races.

Finally, for the Russian forces, the camel for steppe campaigns cannot be replaced. The character of all Central-Asian wars demands that prior to the commencement of military operations there shall have been collecting (for several months beforehand) a large stock of camels, for at the theatre of war the process cannot be carried on either by purchasing or by seizure. A vast system of transport is indispensable, and the machinery for the inauguration of such cannot be set in motion at the last hour. Experience of many years has shewn that this transport must consist of camels. During the Khivan campaign of 1839-40 more than 10,000 camels were procured for the Russian detachment at 10 roubles (£1-5) apiece. For the Khivan expedition of 1873, 8,800 camels were equipped for the Turkistan detachment alone, and to these another thousand had soon to be added. The Kizil-Kum Kirghiz furnished most of these animals; but some hundreds were sent by the Amir of Bukhara.

Experience of steppe campaigns in Turkistan has moreover placed it beyond doubt that the best method of equipping the operating force



with camels is by contract. The military authorities arrange with the contractors that they shall convey the required quantity of stores, &c., for the troops to a given point for a stipulated sum.

A well-known military writer, the late Lieutenant-General Ivanin, proposed in 1873 that a permanent camel-train should be established in the Turkistán military circle on the same basis as those existing in Algeria and in India.

The necessity for a permanent camel-train, in General Ivanin's opinion, lies in the fact that for a war a large quantity of camels is at once required, to collect which speedily is difficult; and even were this to be done in good time the secret of the campaign becomes divulged and the enemy placed in possession of the objects in view. Besides this, according to Mons. Ivanin, with a large complement of camels a considerable number of drivers is momentarily required, and the getting together of such men is a difficult operation, the troops knowing nothing whatever about lading and unlading the animals served out to them. The existence of a permanent camel-train, and a proper number of *loutchis* or drivers always at hand, would insure the speedy acquaintance on the part of the troops with the habits of their transport animals.

General Ivanin himself recognised the high cost of maintaining a permanent camel-train, and he therefore proposed to keep up in time of peace the nucleus only of such means of transport, making up the rest according to the measure of the judged necessity before the outbreak of the particular war.

Lieutenant-General Ivanin's memorandum was forwarded to a Military Scientific Committee of the General Staff of the Turkistán military circle, and was reported upon by that Committee in the year 1873. The committee almost unanimously decided against the fitness of a permanent camel-train for Turkistán, even on the cadre system, and this because the maintenance thereof would prove too costly, whilst in war-time it would still be necessary to search in every direction for the greater number of animals required. Consequently the deficiency would still to a considerable extent have to be made good, and the having to place the train on a war footing on the outbreak of a campaign would not be avoided. In Turkistán the theatre of warlike operations is extremely diversified in respect of locality, *i.e.*, whether on the steppe, in populated districts, or in the mountains. In the first contingency camel-carriage exclusively would be necessary; in the second the native *arbas*, or carts with harnessed horses, might be utilized; whilst in the third instance pack horses alone could be made use of.

In Algeria, especially in the most advanced point to the south, Laghouat, a permanent camel-train of 500 animals with a complement of drivers, is maintained. This train is in constant readiness to start with the flying column (comprising one battalion of Zouaves, one of

Turcos, one squadron of Chasseurs d'Afrique, one squadron of *Spahis*, with two guns), which forms the movable strength of the Laghouat garrison.

The French have occupied Laghouat since 1852, and their further progress into the depths of the Sahára is not apparently within the near future. The operations of the Laghouat flying column are confined to quelling insurrections amongst the nomad Arabs, and for such a purpose unusually rapid movements are necessary. Owing to the poverty of these Arabs no very powerful military machinery is needed, so that 500 camels amply suffice for the wants of the operating column. Indeed its operations partake more of the character of a simple chase.\*

The Russian position in Central Asia must, however, be regarded in quite another light. Russian troops have there to fight with the ruling Kháns who often possess both organised troops and artillery. Russian detachments must, therefore, be of much greater strength than those French columns of which we have just been speaking. They must in fact comprise from 3,000 to 5,000 men, and for such bodies a train of pack animals, made up of several thousands, is required. The above are the grounds on which the idea of establishing a permanent camel-train in Turkistán has been completely abandoned.

A much more important matter for the Russian forces in Turkistán lies in the settling of the question as to how to obtain camels when war breaks out. Prior to the date of the Khivan expedition, this was always done by bringing the requisition system into play in all steppe campaigns. The camels so obtained were paid for at so much per head at rates that were determined by the Local Administration. With the camels the natives were expected to provide a certain number of drivers, viz., one man for every seven camels. But the system was not altogether advantageous. In the first place the natives brought out their worst and weakest camels, and these animals could by no means be made to carry the regulation loads;† hence every calculation as to the hiring of a given number of camels is upset; secondly, the drivers who present themselves are selected by the natives themselves from amongst the poorest of their numbers—persons who never owned a camel, and therefore without the knowledge as to how to deal with this animal, and without the slightest interest in the preservation of the physical strength of the beasts entrusted to them. To a

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\* In the numbers of the "Army and Navy Magazine" for December 1881 and January 1882 will be found my translation, entitled the "French Permanent Camel-train in Algeria," forming an English version of a portion of the report on Algeria by the Russian Colonel, A. N. Kuropátkin.—*Trans.*

† In the case of trade caravans the load is a fixed one, amounting to 16 *puds* (lbs. 576), or for the one-humped Khivan camel (*nar* or dromedary) as much as 18 *puds* (lbs. 648). During the movements of troops, owing to the difficulty of regulating the rate of progress of *all* the pack-animals, and to the fact that camels get sooner tired when so employed than when used to carry merchandise, the several loads are reduced to a uniform weight of 12 *puds* (lbs. 432).—*Author.*

driver of this class it becomes quite the same thing whether the camel in his charge is fed and watered on arriving in camp or not. He is not disquieted if a badly adjusted load cuts into the flanks of his beast, and if the barrel of his camel becomes hide-bound, if not actually lacerated, he is not concerned. But nevertheless a badly fitting load, and one of unequal weight on either side, rolls more about and therefore harasses the camel, which is then prematurely deprived of its carrying power. To such a custodian it matters not whether the animal continues to live, or whether it sinks down from sheer weakness to die on the road. Nay, he is even the better pleased if the latter contingency occur, because then the circle of his obligations grows limited. The maintenance of, and the supervision over, the drivers too are matters of extraordinary difficulty. These men must be fed, so provisions have to be carried for them. This duty entails a considerable addition to the already huge amount of military stores. It is not possible to pay the drivers in kind when a like practice is not resorted to in the case of the troops. Moreover on the steppe it is often quite impossible to buy provisions for money, whatever be the amount. The drivers comprise a disorderly set of great numerical strength, possessed of no discipline, ready to desert at any moment, prone to plunder, and a source of demoralization to the troops themselves. In the expedition of 1839-40 under General Perovski, there were with the detachment, numbering 3,000 men, 2,000 drivers, who immediately they got to the steppe took to flight. The General was therefore obliged to shoot two of the number who were caught. Desertion was thus stopped, but the worry with these men continued, and to such an extent that the detachment became, so to speak, an escort for its own camel-drivers.

In like manner to the Turkistán detachment in the Khivan expedition of 1873, the camel-drivers gave not a little trouble. When this detachment started on the campaign it was accompanied by 1,250 drivers. Their condition was indeed unenviable, each man received 15 *kopaikas* ( $4\frac{1}{2}d.$ ) and one lb. flour *per diem*, but with the money they could do nothing, whilst to cook *chapathis* with the flour was a difficult operation. The further the detachment advanced into the expanse of the Kizil-Kum sands the desertion of the drivers became more and more frequent, and as the deserters took their camels with them, several head being sometimes carried off by one man, it need scarcely be said how much the drivers added to the difficulties experienced in the progress of the detachment. With the Orenburgh detachment in the same expedition it was altogether different. Transport consisting of pack camels was furnished to it by the contractor, Miyakinkoff. These animals were healthy and strong. The owner went with his beasts and was interested in their well-being.

This detachment therefore experienced neither loss of camels nor desertion of drivers. The cost of its carriage was of course considerably higher, because the contract system is much more expensive than the supply of camels by requisition. But, on the other hand, in military

undertakings economy should be quite a secondary consideration. When this rule is not practised the object of the expedition is exposed to risk, and may even result in greater pecuniary loss.

From experience gained in the way we have just stated, in the future steppe campaigns of Russia the supply of pack animals by contract will no doubt be sought.

Looking to the importance of camels in the economic life of the native of Turkistán, I consider it necessary to here insert some information regarding the breeding, treatment and care of this animal.

In Turkistán there are two species of camel, viz., the two-humped (*tuya*), and the one-humped or dromedary (*nar-tuya*), the former being much the more commonly met with.

The one-humped species endures the frosts with difficulty, and is therefore confined to the more southern localities. The crossing of the two breeds gives results, and the Kirghiz avail themselves of the fruition to improve the hybrids so obtained.

The coupling of camels usually takes place during the winter, and the male animal begins to show signs of getting *mast* during the months of December and January. At such a time he becomes restless, eats but little food, and rapidly deteriorates in appearance. He refuses water, becomes furious, cries out, attempts to bite any passer-by or even his master, and runs about the herd with an infuriated look, glistening eyes, and with foam about the mouth. The exasperation of the animal increases more and more in consequence of his unaided efforts to attain his desires, but such attempts are fruitless and unsuccessful unless man comes to his assistance.

This assistance is not afforded before the month of February for the following reason: The female carries her young about a year and sometimes 11 months, but in most cases she goes for thirteen months. Consequently, were the newly-born suckling to be thrown before the setting in of the spring season, it would have to experience a severe winter, and be exposed to destruction from the cold.

Its appearance is, therefore, delayed until the month of March, and even then on the steppe it is very cold. In order to protect the little one, it is carefully wrapped up in felt, space being left for its head and neck; at night it is taken into the owner's *yurta*, and for a month it is shewn to no one from the dread lest some passer-by should cast thereon his evil eye, and so bewitch the suckling.

During the first three or four weeks the young camel (in Kirghiz *bata*) is borne in the hand to its mother to suckle, and this because it is only after the lapse of some time that the suckling obtains the power of standing on its long and slim legs. For two or three months of the

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\* In Mongolia the species of the camel is almost entirely confined to the two-humped (Prjevalski's "Mongolia"); in North Africa, on the other hand, the one-humped animal prevails.—*Author*.

summer it is allowed to be with its mother, who does not cease to suckle it for a whole year. Meanwhile the young one is taught to nibble the grass, and to this kind of food it adapts itself more and more, although it still obtains milk from its mother for one and sometimes a second year.

After a year, by which time the young camel has become strong, its nostrils are bored, and through the hole thus made is inserted a smoothly cut piece of bone or stick (*burunduk*), to which a cord is then attached, and by this the animal is guided. The bone or stick is never taken out, so that the camel carries it for life. When on the march the nose cord of the rear camel is fastened to the saddle (*chom*) of the animal in front. In this way the whole file of camels forms as it were one long string. For this file or string but one driver is required, and he guides the whole from his seat on the camel in front of all. Should he be mounted on a horse or mule he drags the leading camel by a cord. But as a rule his seat is on a saddle placed between a camel's humps, and his way of guiding the beast under him is by kicks or the use of a whip.

The young camel having been fitted with a nose-cord is taught to sit down on hearing the sound *chok*, and to rise on the word *chu*, the cord being lowered or raised according to the movement required of the animal in training. These constitute the first necessary exercise, because all the subsequent lading of the animal takes place whilst it is sitting on the ground.

Sometimes during the first autumn the young camel is made to carry a small load, but this is put on more as an amusement, and as a preliminary to future service. The second year the trifling weight is sensibly increased, and during the third the young camel sometimes carries a weight of 10 *puds* (360lbs). On attaining the age of 5, the camel is held to be full grown; in other words fit to carry a load of from 16 to 18 *puds* (546 to 648lbs). Up to the age of 15 the camel is possessed of full powers; it then begins to weaken and rarely reaches the age of 25, its early death being brought on through hard work and bad treatment. Without such hard work a camel has reached the age of 40 or even 45. The camel was introduced into Central Asia by the Arabs, and amongst the Turkistán nomads has been brought to a condition of surprising obedience. When in pain this docile animal utters only a plaintive cry and betrays no signs of temper. All camels are taught to come to the watering place on the word *sorrop*, which in Arabic is expressed by *diráb*. A camel with a full load moves at the rate of about  $3\frac{1}{4}$  *versts* ( $2\frac{1}{4}$  miles) per hour, but if the load be reduced the above pace is increased to  $4\frac{1}{2}$  or even 5 *versts* (3 to  $3\frac{1}{2}$  miles) in the same time. The trot of the camel enables the animal to cover 10 *versts* ( $6\frac{2}{3}$  miles)\* within the hour. Its gallop is fairly rapid, but all its movements, except the walking pace and the

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\* A good Bikaner riding camel will beat this.—*Trans.*

amble, are very shaking and uneven. Young camels scarcely yield to horses in the quickness of their gallop. Kirghiz often harness this animal to their carts, the shafts of which are attached to cords fastened to the foremost hump. When so made use of the camel will draw a weight of 20 *puds* (720lbs), and this as an ordinary rule. The weight is by this method still thrown on the back. When harnessed to a properly constructed cart a camel can easily draw from 50 to 60 *puds* (1,800 to 2,160lbs) weight. In the course of nomad wanderings the greatest distance that a camel is required to traverse in the 24 hours is 50 *versts* (33½ miles). When used with caravans from 35 to 40 *versts* (23½ to 26½ miles) is the length of the average stage. The ordinary Kirghiz summer move or *kotch* amounts to 25 *versts* (16½ miles).

After the completion of each march camels are made to lie down; their loads are then removed, the animal remaining in a sitting posture for from 1½ to 2 hours, after which they are taken out to graze. But this procedure only obtains when the camels are used with caravans. During ordinary nomad peregrinations on account of the lesser distances covered and the much lighter loads, an hour suffices for unloading and taking out to water and to graze. But, however heavy be the load, and however protracted the march, the period of rest allowed to caravan camels never exceeds two hours, and this because the interval between the completion of the march and the nightfall is but a short one, and because a camel eats only during the day. This animal eats very quickly and is satiated within a space of from two to three hours. At night camels are not left out on the grazing ground, but are brought to the *yurtas* or encampments, and there huddled together. During winter moves great care is required on the part of those in charge of camels, because this camel cannot rest where there is snow. In such cases the ground must be thoroughly swept and cleared beforehand, otherwise the heavy perspiration which exudes from this animal would quickly cause it to catch cold. Moreover the moisture generated by this exudation would, after cooling, freeze the animal's hair and fasten it to the earth from which it would be difficult to disconnect it.

At daybreak, and before being laden, the camel is once more taken out to graze for an hour, a period that completely suffices to satisfy the animal's stomach for the entire day. It is necessary to observe, however, that this repletion still admits of the constant nibbling of the animal at any chance forage met with on the road. There is scarcely another animal that is less fastidious, both as regards its food and drink. Apparently the camel will eat only the coarsest grasses that are quite unfit for the food of any other animal. *Polin* (*juzán*), reeds, *kua*, sedge-grass, thorns, *chii* (steppe-grass), all plants, in fact, unfit for horses' food, furnish the camel with dainty and unfailing sustenance. In like manner the same animal will drink every kind of water, no matter how brackish, stagnant, or putrid.

A camel can go for two, three, or even four days without drinking, and though he is weakened thereby, still he as pluckily carries his load as though he had had water enough. During the summer a camel generally drinks but once in the 24 hours, and in autumn and winter but once every two or three days, especially if water is at all scarce.

The same animal can pass three days without food. But either deprivation of solid food for two days, or of liquid food for four consecutive days, greatly weakens it, and in order to prevent it perishing under such privations its load must be immediately and very materially reduced, the full weight not being reimposed until the lapse of a week from the date of the restoration of the named necessities.

In the beginning of spring, camels generally cast their hair, which falls until the animal's hide is almost completely bare. The full-grown animals at such a time have only tufts on the head, lower part of the neck, and here and there on the thighs. By the setting-in of winter the hair begins to grow again, still it is not sufficient to give the animal warmth, and therefore the nomads clothe their camels with leathern *jhuls*. The same coverings too are put on, even in the summer season, especially in localities swarming with gadflies that so terribly afflict animals of every kind. The country along the central and lower course of the Sir, and even at the mouth of the Amu, is so infested with these pests that cattle simply cannot exist there in the summer season, and are therefore removed by the nomads from the places just indicated.

Camels do not readily fall from fatigue, but if the weight of the load causes them to do so, it is not possible to move them.

Even if the load be removed a jaded camel need not be further dealt with, and can only be left by the roadside.

Camels are not subject to epidemic diseases. Siberian plague or *yázva*, which afflicts both horses and horned cattle, is innocuous to camels. But glazed frost, of which mention has been made in a previous chapter, causes almost as much destruction to camels as to every kind of herd. But since the camel is able to nibble at reeds and bushes it effects its own preservation to a greater extent than can any other animal. With the reappearing of spring grasses the emaciated camel picks up more slowly than cattle of any kind, and indeed can scarcely be said to be in condition till the autumn season has set in. For this reason, during the spring, loads of greater weight than 12 *puds* (432lbs.) are not at once put upon camels, but by degrees until the weight reaches the normal standard.

A camel, more than any other animal, dreads moisture, which indeed kills it. Accordingly the nomads always strive to get away from those localities wherein a large quantity of stagnant water generates moisture in the atmosphere.

Amongst the number of diseases peculiar to camels the *Sarpo* sore should be enumerated. This causes the soles of the animal's feet to fall off. Its cure is effected in the following manner :—

The entire leg of the camel below the knee is washed with camels' milk, and round it is then sewn a leather covering filled with hot mutton fat. This covering, by closely adhering to the diseased foot, moulds itself to the shape thereof. Should the camel be rested after this treatment the sore will heal very gradually. Generally speaking, however, freedom from work and perfect rest are the most real cures in practice by the nomads for all possible ailments, internal and external, appearing amongst their camels. Should an excessive weight or an ill-adjusted load be placed on the animal, sores will appear on its back and flanks.

In such cases, if the animal does not get time to rest and to recover from the chafing, its load, by rubbing against the excoriated part, will induce deep-seated ulcers, but to neither of these evils do the nomads pay much attention. It is only when worms appear in such wounds that they operate with wooden needles ; or else, having lanced the whole of the afflicted part, they apply a poultice of mutton fat or of chewed *chi'* grass, or finally, when the removal of the worms becomes a difficult operation, they smear the sore or ulcer over with snuff.

Old or diseased camels that are unfit to carry loads the nomads kill and eat. The meat is not tasty and, moreover, is tough. That, however, of the camel suckling is very much prized, and procurable only by the few rich folk who treat themselves to the delicacy on the rarest and most extraordinary occasions.

Camel's milk is rarely enjoyed by the nomads during the winter. In the autumn season with good milking the female camel will yield two or three *shtoffs* (square bottles containing about one-tenth part of a bucket) in the 24 hours, but she will not give more than sixty pailsful in the whole year.

Camel's hair is used for various purposes (*vide* previous chapters). The camels are shorn in June, and about 12lbs. of hair are taken from each. The most common articles manufactured from it are *Armyá-chinas*, bags, (*Kaps*), *Kibitka* fastenings, lassoes, and the like.

Camel's hide is likewise used for the manufacture of domestic utensils, straps, &c. The cost of a hide is about 2 *roubles* (5s.) or, perhaps, higher.

At Tashkand a camel sells for from 50 to 80 *roubles* (£6-5-0 to £10), and about the same price obtains in other parts of Turkistán.





## V.

# THE RUSSIAN MOUNTED TROOPS IN 1883.

BY LIEUT. J. M. GRIERSON, R.A.

IN 1882 I had the honor of publishing, in the Proceedings of the United Service Institution of India, a paper on the "Russian Cavalry," based upon what I saw of that arm during the manœuvres of 1880. Since the publication of that article important changes in organization have been introduced; indeed the Russian cavalry has been reorganized off the face of the earth. I have used above the words "mounted troops" advisedly, for, with the exception of the ten regiments of the Guard, who have preserved their former designations, uniforms, and armament, the cavalry have been transformed into an hermaphrodite force of "Dragoons," who have been aptly designated as "soldiers who fight indifferently well on foot and on horseback." Those changes have not been carried out without a considerable amount of opposition in the arm; indeed it was reported in a German paper that the officers of the former Hussar regiments had tendered their resignations in a body. Following the lines of the former article we have to consider—

### I.—GENERAL ORGANIZATION.

The mounted troops stationed in Europe consist of—

|                       |   |    |                                                       |
|-----------------------|---|----|-------------------------------------------------------|
| <i>Guard Cavalry.</i> | { | 4  | Regiments of Cuirassiers.                             |
|                       |   | 2  | Ditto Hussars.                                        |
|                       |   | 2  | Ditto Lancers.                                        |
|                       |   | 2  | Ditto Dragoons (Guard Dragoons and Horse Grenadiers.) |
|                       |   | 46 | Regiments of Dragoons (1st to 46th).                  |
|                       |   | 19 | Ditto Cossacks (1 of the Guard).                      |
|                       |   | 28 | Batteries of Horse Artillery (5 of the Guard).        |
|                       |   | 8  | Ditto Don Cossack Horse Artillery (1 Guard).          |

In the Guards no changes have been made, and the stations of the Line Divisions have only been changed in a few isolated instances, the general distribution remaining as before. The regiments have been renumbered throughout, thus—

| The old | 1st Dragoons is now | 1st Dragoons. |        |
|---------|---------------------|---------------|--------|
| "       | 1st Lancers         | "             | 2nd "  |
| "       | 1st Hussars         | "             | 3rd "  |
| "       | 14th Dragoons       | "             | 40th " |
| "       | 14th Lancers        | "             | 41st " |
| "       | 14th Hussars        | "             | 42nd " |
| "       | 15th Dragoons       | "             | 43rd " |
| "       | 18th "              | "             | 46th " |
|         |                     |               | &c.    |

The 6th and 7th Don Cossack H. A. Batteries have been attached to the Don Cossack Division, the 13th and 14th Divisions receiving in their stead the newly-formed 22nd and 23rd Batteries, formed from former "reserve" batteries. The 16th to 20th Don Cossack Regiments have been disbanded, and the Don Cossack Division is now composed of the 9th, 10th, 13th and 15th Regiments, the places of the three former having been taken in the Divisions of the same numbers by the 1st Ural and 1st and 2nd Orenburg Regiments, which formerly were stationed in their respective provinces.

## II.—ORGANIZATION OF REGIMENTS.

At present there is a project on foot to augment all regiments to six squadrons, but no change has as yet been made. In the general reduction of effectives, more especially in non-combatants, made in 1882, the strength of cavalry regiments was cut down to the following figures :—

|                                                           |                              |     | War. | Peace. |
|-----------------------------------------------------------|------------------------------|-----|------|--------|
| Regimental Commander (Colonel) ...                        | ...                          | ... | 1    | 1      |
| Divisional Commanders ...                                 | ...                          | ... | 2    | 2      |
| Squadron Commanders ...                                   | ...                          | ... | 4    | 4      |
| Staff Officers (Adjutant, Quarter-Master, Maître d'Armes, |                              |     |      |        |
| Commander of Dismounted Men) ...                          | ...                          | ... | 4    | 4      |
| Subaltern Officers ...                                    | ...                          | ... | 20   | 20     |
|                                                           | Total Officers               | ... | 31   | 31     |
| Squadron Sergeant-Majors (Vachtmistr) ...                 | ...                          | ... | 4    | 4      |
| Sergeant-Major of Dismounted Men ...                      | ...                          | ... | 1    | 1      |
| Maître d'Armes ...                                        | ...                          | ... | 6    | 6      |
| N. C. Officers { 1st Class ...                            | ...                          | ... | 16   | 16     |
| { 2nd Class ...                                           | ...                          | ... | 29   | 28     |
| Regimental Trumpeter ...                                  | ...                          | ... | 1    | 1      |
| Trumpeters ...                                            | ...                          | ... | 16   | 16     |
| Trumpeter Pupils ...                                      | ...                          | ... | 4    | 4      |
| Corporals (Gefreite) ...                                  | ...                          | ... | 16   | 16     |
| Troopers ...                                              | ...                          | ... | 604  | 604    |
| Volunteers ...                                            | ...                          | ... | 16   | 16     |
|                                                           | Total N. C. Officers and Men | ... | 713  | 712    |
|                                                           | Total of Combatants          | ... | 744  | 743    |
| Non-Combatants ...                                        | ...                          | ... | 91   | 87     |
|                                                           | GRAND TOTAL                  | ... | 835  | 830    |

### Horses.

|             |                                  |     |     |     |
|-------------|----------------------------------|-----|-----|-----|
| Riding ...  | { Officers' (State property) ... | ... | 24  | 24  |
|             | { Troop ...                      | ... | 577 | 577 |
| Draught ... | { For the Train Wagons...        | ... | 51  | 16  |
|             | { Ridden by Non-Combatants ...   | ... | 4   | 0   |
|             | Total                            | ... | 656 | 617 |

The effectives of the Horse Artillery Batteries have in like manner been modified. Those of the Guards and Line have each—

|                            |     |             |                         | War. | Peace. |
|----------------------------|-----|-------------|-------------------------|------|--------|
| Combatants                 | ... | { Officers  | ...                     | ...  | 5      |
|                            |     | { Men       | ...                     | ...  | 185    |
| Non-Combatants, all ranks  | ... |             | ...                     | ...  | 31     |
|                            |     |             | ...                     | ...  | 21     |
| Horses                     | ... | { Riding... | { Officers              | ...  | 5      |
|                            |     |             | { Battery               | ...  | 99     |
|                            |     | { Draught   | { Artillery Wagons, &c. | ...  | 123    |
|                            |     |             | { Train Wagons          | ...  | 16     |
| Guns                       | ... |             | ...                     | ...  | 6      |
| Wagons and other carriages | ... |             | ...                     | ...  | 12     |

The junior batteries in each division have six non-combatants fewer, and in the batteries belonging to the 1st, 7th, 8th, 9th, 10th, and 15th Divisions, which, it will be remarked, are stationed at some distance from the frontier, there are only 40 draught horses in peace as these have no ammunition wagons horsed. The effectives of the Don Cossack Regiments and Batteries have not been modified. The three Ural and Orenburg Regiments have only lately been incorporated with the European Cavalry Divisions; the other regiments of those "Armies" are serving at present in the Turkistan district. A regiment of the former has 1,025 men in peace and 996 in war; of the latter, 865 in peace and war. Bearing in mind the slight variation in the strength of a Division caused by the presence in it of Ural or Orenburg Regiments or of Cossack Batteries, the normal Russian Cavalry Division consists of, on a war footing—

|                        | COMBATANTS. |            |              | NON-COM-BATANTS. |            | Guns.      | Other Carriages. |
|------------------------|-------------|------------|--------------|------------------|------------|------------|------------------|
|                        | Officers.   | Men.       | Horses.      | All ranks.       | Horses.    |            |                  |
| Staff                  | ...         | 9          | ...          | ...              | 28         | 13         | ...              |
| 3 Dragoon Regiments    | ...         | 93         | 2,139        | 1,803            | 273        | 165        | ...              |
| 1 Don Cossack Regiment | ...         | 21         | 886          | 907              | 58         | 98         | ...              |
| 2 Batteries H. A.      | ..          | 10         | 370          | 554              | 56         | 32         | 12               |
| Cavalry Park Section   | ...         | ...        | ...          | ...              | 161        | 177        | ...              |
| <b>TOTAL</b>           | ...         | <b>133</b> | <b>3,395</b> | <b>3,364</b>     | <b>476</b> | <b>485</b> | <b>12</b>        |
|                        |             |            |              |                  |            |            | <b>129</b>       |

Now that Orenburg and Ural Cossack Troops enter into the composition both of the European and Asiatic armies, it is difficult to estimate the exact force of cavalry at the disposal of Russia for a war on her European frontier. (The Caucasus Army is excluded from this paper). The Don Cossacks have been reduced to 47 Regiments (2 of the guard) and 22 Batteries (1 guard) in war. From Thilo von Trotha's "Die Mobilmachung des Russischen Heeres, 1877," we learn that in 1878 the Orenburg Cossacks mobilized 14 regiments, of which the 6th and 7th were employed in the Caucasus and the 8th and 13th reached St. Petersburg in July 1878. Their present organization allows of 6 regiments of 5 sotni (1st category) and 12 of 6 sotni (2nd and 3rd categories), and 8 H. A. Batteries of six guns being mobilized. Of those the 3rd, 4th, 5th, and 6th regiments and 1st and 5th batteries are

at present in Turkistan, and must be left out of consideration. Similarly the Ural Cossacks furnish in war 1 guard sotnia and 9 (in peace 3) line regiments of 6 sotni. Of these the 2nd regiment is in Turkistan and must be omitted. We omit also the Caucasus Dragoons. The Astrakhan Cossacks furnish in peace 1, in war 3, regiments of 4 sotni.

The total war strength of the Russian cavalry is, therefore, in the European part of the empire—

|                         |                    |               |            |
|-------------------------|--------------------|---------------|------------|
| Guard Cavalry           | ... 10 Regiments = | 40 Squadrons. |            |
| Dragoons                | ... 42 „ =         | 168 „         |            |
|                         | <b>TOTAL</b> ...   | <b>208</b> „  |            |
| Don Cossacks            | ... 47 Regiments = | 282 Sotni.    |            |
| Orenburg Cossacks       | ... 14 „ =         | 82 „          |            |
| Ural Cossacks           | ... 8 „ =          | 49 „          | (1 guard.) |
| Astrakhan Cossacks      | ... 3 „ =          | 12 „          |            |
|                         | <b>TOTAL</b> ...   | <b>425</b> „  |            |
| Regular Horse Artillery | 28 Batteries =     | 168 Guns.     |            |
| Don Cossack „           | ... 22 „ =         | 132 „         |            |
| Orenburg „              | ... 6 „ =          | 36 „          |            |
|                         | <b>TOTAL</b> ...   | <b>336</b> „  |            |

### III.—CLOTHING, ARMAMENT, AND EQUIPMENT.

The uniform of the Guards has remained unchanged. On service in future the forage cap would be worn, as in the entire Russian army. In the matter of equipment, the Cuirassiers have been supplied with wooden scabbards covered with leather and suspended by a cross-belt over the right shoulder instead of, as formerly, by slings. The lance has been taken away from the front rank of the two Hussar regiments, and is now only carried by the front rank men of Cuirassier (Guard), Lancer (Guard) and of all Cossack regiments, whether Guards or Line. It was taken away from the rear rank men of Cossack regiments by the decree of the 22nd April 1883. Thus the “Queen of Weapons” is going out of favour in Russia.

*Dragoons.*—The tunic of the Dragoons is dark-green, fastening with hooks and eyes, with collars, cuffs and shoulder-straps (latter with the regimental number and fastening with a button) of scarlet, light blue, white, yellow, orange, cinnamon, rose colour, light green, lilac, crimson, or turquoise coloured cloth. The pantaloons are greyish-blue, cut loose and worn invariably inside long boots with unstiffened legs with heel spurs. The full dress cap is a low busby of Astrakhan fur, with the arms of Russia in front. The undress cap is a green cap of the same shape as that worn in the German Army, with a band of the colour of the regimental facings. This cap is also worn on service. The waist belt is of white leather and carries two ammunition pouches, supported by a strap over the

left shoulder. The sword is carried in a frog supported by a belt over the right shoulder. The rifle is carried as before described, also the bayonet. Great coat as formerly ; also saddlery.

*Horse Artillery.*—The tunic fastening with hooks and eyes and the lambswool busby have been adopted, otherwise the uniform remains as formerly.

Passing over Sections IV (Pioneer Equipment) and V (Saddlery), under which heads no changes have, as far as we are aware, been introduced, under Section VI (Horses) it is to be remarked that officers under the rank of squadron commander are now provided with one horse by the State and are expected to provide themselves with a second charger.

#### VII.—CHARACTERISTICS OF THE VARIOUS ARMS.

It must be remarked that this wholesale transformation of the Russian cavalry into mounted infantry has not been adopted without much opposition in Russia, both in the army and in the press. The German military papers have almost unanimously condemned the measure, and it will be interesting in a future and by-no-means impossible war to watch the struggle between the magnificently trained *cavalry*, in every sense of the word, of the German Empire, and the mounted Riflemen and Cossacks of their eastern neighbours. The Russian ideas “pro” on the subject are well illustrated by the following article of the *Moscow Gazette* :—

“The measure now adopted is the first step towards a complete and remarkable transformation of the Russian cavalry and an augmentation of our mounted troops—changes which have been necessitated by the modern mode of action of this arm. A year ago, a committee of specialists was appointed to study the reforms, and its work has now been definitely completed. The committee recognised that it was indispensable to increase the strength of the cavalry, and has found a means of so doing without incurring increased expenditure. The recent transformation of the Lancers and Hussars into Dragoons has permitted of an addition being made to the horse artillery.

“This transformation has not only been carried out from motives of economy, it has importance from the tactical and strategical consequences it entails. A cavalry armed with rifles and supported by good horse artillery will enjoy an independence hitherto unthought of ; without the support of infantry it can undertake long expeditions and appear in rear of an adversary to break his line of communications, destroy his magazines and railways, and impede his mobilization. At the beginning of this century, during the wars of Napoleon I, our partisan corps struck many vital blows at the enemy and rendered his operations extremely difficult. Precisely with this intention the Emperor Nicholas formed a special corps of Dragoons, but these had no oppor-

tunity of rendering the services expected of them.\* The experiments made by this sovereign were justified by the success of the raids of the American cavalry in the secession wars. Since then the idea of cavalry raids on a large scale has been much taken up by cavalrymen, although we have no examples of such raids during recent wars in Europe. In 1877, however, several attempts of this sort were made, the most remarkable of which were the turning movement made against the army of Osman Pasha and the occupation of the bridge of Bar-boshi† thanks to which the destruction of one of the most important points of passage on the Danube (? Sereth) was prevented. For the last ten years in Western, and especially in German, literature the idea has been gaining ground that in a future war with Russia, cavalry will play a decisive part, and it is even argued that an army invading our country, and not possessing the means of throwing large bodies of cavalry working independently in rear of our armies, will inevitably share the fate of the armies of Charles XII and Napoleon I. To paralyse such raids our cavalry must be superior to that of the enemy, and capable of repulsing the attacks of the enemy and at the same time of throwing itself on his rear. We must not forget that our mobilization takes longer than that of other powers, and therefore we must gain time.

“Every body of cavalry which undertakes far-reaching operations on a large scale, or which ventures to a considerable distance from the main body of its army, must be ready to act under all circumstances. It can hope for no success if it cannot overcome a body of infantry which it encounters. The German cavalry experienced this in 1870-71, and in certain cases it had to be accompanied by detachments of infantry in wagons. With our Dragoons such a precaution is unnecessary, as they carry the same rifles as infantry.

“This, after all, is only one of the phases of the question, as in all wars the most important role of cavalry has been to pursue and destroy a beaten enemy. Since infantry has been armed with quick-firing and long-ranging arms, a pursuit has become more difficult, and if infantry has been able to withdraw from the immediate attacks of cavalry, if only for a few moments, it is tolerably safe from pursuit. An army in retreat will almost always have at its disposal some bodies of infantry in good order, and these bodies can stop the hostile cavalry,‡ and thus save, if not the whole army, at least the artillery. It would be quite a different matter if Dragoons, capable of dealing with infantry, undertook the pursuit, and of this we have had more than one proof during the recent campaign.

“Besides, in the course of a battle, and during operations undertaken by the three arms, many cases will occur in which it will be

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\* Why, is difficult to understand. At the outbreak of the Crimean War the corps (8 regiments) was broken up.—J. M. G.

† Carried out by Cossacks however, *not* by regular cavalry.—J. M. G.

‡ This is not the idea of German cavalrymen of the disciples of Ziethen and Seidlitz.—J. M. G.

necessary to reinforce promptly a line of infantry skirmishers at points where the reserve of this arm cannot arrive in proper time ; it is cavalry who will now undertake this, thanks to the speed of their horses, but a cavalry understanding how to fight on foot, that is, Dragoons armed with rifles.

" The transformation of all the mounted troops into Dragoons will also not fail to raise the quality of the cavalry. Hitherto the instruction has not been uniform, whence it has resulted that in regiments of Dragoons in the same division with regiments of light cavalry, shooting and fighting on foot were not practised with all the care desirable, especially when the commander of the division was not himself a Dragoon. This inconvenience will disappear in future, as all cavalry will practise the same drill on foot or on horseback.

" Russia has made a great stride forwards, and its cavalry places itself now ahead of those of other powers, and will probably hold that place for long. It is not easy for other powers to transform their cavalry into Dragoons possessing the qualities of ours ; to put a rifle into the hands of a cavalry soldier is not enough ; the two branches of the service of cavalry must also be so arranged as not to impede one another. Too great attention paid to fighting on foot might compromise the success of mounted manœuvres and *vice versa* ; that both may be well performed, constant practice, constant manœuvres, and the keeping up of old traditions\* are required. The Russian cavalry is, in this respect, exceptionally favorably situated, as it has, in its Cossacks, a body of cavalry which has never had any other mode of fighting than that now adopted for the Dragoons. This is the reason why no other power in Europe can give to Dragoons the important place in their armies they have always occupied with us, and no effort has been made to attain the object in which Russia has taken the initiative.

" In the foreign press now-a-days it is constantly affirmed that cavalry has lost its value as a fighting element, and has been driven off the battlefield, and that it is therefore necessary to reduce its strength and replace it by infantry who cost less ; those reasonings are not far wrong when the cavalry in question is one which only understands charging in close order, and is incapable of dealing with good infantry, which understands the use of the sword and lance, but is ignorant of the advantages of firearms, and is in consequence incapable of conducting distant enterprises without the aid of the other arms. Such a cavalry can now play only a secondary part, as charges of masses of cavalry have now become rare. This has been understood in Russia, and is why we have definitely renounced cavalry who follow the errors of the days of chivalry.

" In transforming its Lancers and Hussars into Dragoons, the Rus-

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\* This is absurd. The Russian Dragoons, *as a body*, have never been engaged in a war of any importance, and in 1877-78 the mode of action of the Russian cavalry was such as to call for most unfavorable comments.—J. M. G.



sian cavalry has approached more nearly the Cossack type—a type which will never lose its importance. It can perform its duties equally well in mountains and in plains, on broken and on covered ground, and it neither fears to look hostile cavalry in the face nor to attack hostile infantry.”

#### VIII.—TRAIN.

The train of a Dragoon regiment consists now of—

|                         |                              |
|-------------------------|------------------------------|
| 1 Ambulance.            | 1 Field Officer's Carriage.  |
| 1 Apothecary's Cart.    | 6 Officers' Baggage Waggons. |
| 2 Ammunition Waggons.   | 4 Provision Waggons (light). |
| 1 Treasure Waggon.      | 3 Sutler's Carts.            |
| 1 Medical Store Waggon. | 4 Provision Waggons (heavy). |

All two horses and each occupying 15 paces on the line of march.

In Section IX (Drill) there are no important changes to note, but under the latter head we would draw attention to the important cavalry manœuvres of large bodies, which now take place annually in Russia. Last year the 7th and 8th Divisions manœuvred against one another east of Bender.

#### X.—THE COSSACKS.

Under the heading of Don Cossacks there is nothing new to be noted, except that the number of line regiments has been reduced to 15 in peace and 45 in war. For shacos have been substituted low busbies with scarlet top and busby-bag. We have mentioned above the war and peace strengths of the Orenburg, Ural and Astrakhan armies, the organization of all is precisely similar to that of the Don Cossacks except that in the Ural army a certain amount of voluntary enlistment is permitted. The dress of the Astrakhan and Ural Cossacks is the same as that of the Don Cossacks; but with yellow and crimson facings and busby bags respectively; that of the Orenburg Cossacks is similar in cut to that of those of the Don, but dark green in colour, with, for cavalry, light blue facings and busby bags, for artillery black facings with scarlet piping and scarlet busby bags.

## VI.

### MOUNTED INFANTRY.

TRANSLATED FROM THE "VOYENNEI SBOBNIK," A RUSSIAN MILITARY MAGAZINE.

BY LIEUT.-COLONEL H. M. BENGOUGH,

*With a Note by the Translator.*

THE question of the permanent entertainment in time of peace of a body of infantry mounted on horse back, or "mounted infantry," as also of the formation of such a body in case of the mobilization of the army for a general war, must be without doubt decided in the negative, as not suitable to the fundamental and unchangeable nature of the various kinds of weapons. On the other hand the employment of all methods for the rapid transport of infantry by means of railways, steamboats, horses, or carriages, will always find extensive application in war, in cases where the need of such is apparent, and where the natural obstacles of the theatre of war render such movements practicable. Such obstacles, however, may in many instances show the necessity for the timely organization of a body of mounted infantry such as we formed and used with complete success in Turkistan, or similar to the body of English Infantry in the late Anglo-Egyptian war: but it is unnecessary to point out that between these completely contrary objects of improvising a body of infantry with no change of weapons equipment and supplies, and the formation of a permanent body of mounted infantry, there is a vast difference.

However, considering that this question has been mooted in the foreign military press, we think it proper to make our readers acquainted with an article by the well known French author, General Leval, (*Journal des Sciences Militaires*, October 1882), and with the results of a meeting held in the "United Service Institution" which discussed from every point of view the question of the use of mounted infantry, and which came to a sufficiently clear decision, but one clouded by the short-sighted desire to combine in one a class of weapons incompatible, and indeed opposed in their nature to each other.

The rapid and long marches in Algiers, Mexico, Zululand and other places afford numerous proofs that those operations can be easily performed on the simple condition of relieving the men of their burdens. With this object many means are proposed, amongst others the plan of placing the kits on pack animals, which accords with the English system. In the Abyssinian expedition the number of conductors muleteers, &c., exceeded the total number (3,000) of the expeditionary corps.

In the late Egyptian expedition mention is made of a single regiment of Bengal Lancers in which there were four hundred pack animals for three hundred and sixty troopers. This expedition may serve as a complete proof of the unsuitability of such an organization. The troops could barely move, and continually arrived late in consequence of the numerous baggage train, especially in the desert. Twenty days (*viz.*, from 24th August to 12th September) were required to move the Army to Tel-el-Kebir, a distance of thirty miles from Ismailia. In the same way the daily marches did not exceed on an average one mile and a half. Other writers describe the organization for 250 men rank and file, as 42 pack mules (six packs on a mule), 53 mules for the officers' baggage, reserved ammunition, and supplies, ten mules for sick, wounded and invalids, and five mules for stores.

Such a cumbersome organization is applicable to prolonged operations, and to the invasion of a country deficient of the necessary means of subsistence for an army. At the same time it is impossible to recognize such means of carrying on these operations as successful. An attack on two lines or rayons is much preferable. In this way *dépôt-bases* can be formed in the country comprising the theatre of war, from whence detachments can be sent out in different directions.

Lastly, the possibility has been shown of transporting troops on carriages or animals. Carriages are unsuitable: they give much trouble, they are difficult to procure, and they are generally useless on the bad roads which are most favourable for invasions; they cannot however be unconditionally rejected; their employment will be advantageous especially if they can be collected on the road by requisition, and left behind when not required. Besides this infantry have been mounted on camels, horses and mules.

This question is not a new one. The first example occurs among the Macedonians, whose troops apparently operated on foot in line and on horse back, that is to say were infantry mounted on horses. The Romans made use of horses as a means of transporting their infantry. Their troopers almost always dismounted to fight. These were again mounted infantry, and this explains why the so-called Roman cavalry were for a long period altogether bad. In ancient times the Grecian and Roman cavalry bore the character more especially of mounted infantry. A part of the men were mounted on horse back and dismounted for action, but it is impossible to consider this formation equivalent to regular cavalry of line of battle. In the Middle Ages on the contrary the soldier was generally mounted; cavalry was the only arm, infantry disappeared. The latter again acquired significance on the introduction of fire arms. Their action became so important that it was sought to give them mobility; thus in a short time Mounted Arquebusiers appeared who apparently quickly became regular cavalry of line of battle rather than infantry.

In latter times, more especially in the English military world, attention has been drawn to the advantages which would result from

the formation of a body of mounted riflemen, composing a part of the regular army, but especially intended for service in the Colonies. This idea received further extension at the time of the unsuccessful campaign against the Transvaal Boers, the expedition into Zululand, and the late campaign in Afghanistan. Several organs of the English press devoted their columns to the resolution of this question. In its turn the Royal United Service Institution held a meeting on this subject; finally the question was brought before Parliament during the past year, and gave rise to an interesting debate.

"If we review the role of cavalry," wrote General Wolseley in 1871, "with reference to the attack of a position held by an enemy, we shall be convinced from the experience of the war, 1870-71, that this arm ought to constitute the eyes and ears of the army. The time for the attack by masses at close quarters has passed away. It expired during the last war. At Sedan whole regiments of French cavalry were annihilated by infantry fire, and by their despairing efforts only showed that the spirit of knightly chivalry still existed in the army to which they belonged."

Generally speaking the conclusions arrived at by Sir Garnet Wolseley from the lessons of the late wars are embraced in this, that the use of cavalry in the line of battle rarely gives now-a-days decisive results. He estimates that for the defence of the flanks of an army, for escort and reconnoitring duties, "mounted infantry and cavalry can be most favourably employed in the proportion of one to four." He adds that in the first war in which England may be engaged it will be necessary to have as many mounted infantry as the foraging capabilities of the country in which operations take place, may permit.

As early as 1872 Major-General Hamley, formerly Commandant of the Staff College, urged the formation of such a body. "For seizing in anticipation of the arrival of infantry, posts or defiles, which cavalry are unable to defend, for rapid flank marches with a view to making, at long distances, a sudden attack on the enemies' line of communications, nothing is better than mounted riflemen. Mount on small horses, men, light, active, strong, hardy, well armed and trained, and you have formed a body such as has never been seen on modern fields of battle, and which for an inconsiderable cost would give important results; the kind of service itself of this body would attract active and enterprising men, who would strive energetically for the attainment of an object."

In 1873, General Wood, in a memorandum addressed to the Duke of Cambridge, urged the necessity for the immediate formation of mounted infantry. "The experience of the campaign of 1870," wrote he, "has confirmed the opinion already entertained by many military men, that every enterprising army should possess henceforth a corps of mounted riflemen. If one should wait for war to form these special troops, their organization would be hurried and consequently bad."

If the above expressed hope has not been fulfilled, and if mounted infantry have not been introduced into the English army, yet at any rate some attempt to employ these special troops has been made during the late campaigns in Africa and Afghanistan. At the time of the expedition into Zululand, some squadrons of mounted riflemen were formed from the colonial troops, and from men selected from infantry battalions. General Wood was one of the most active organizers of these irregular forces.

A squadron of a hundred men was formed in single rank, and was divided into four sections; each section was in its turn subdivided into groups of four men. The sections and groups were always composed of the same men. When they dismounted to fight, the number "threes" of each group remained on horse-back, and held the reins of the horses of their three comrades. The squadron commander dismounted, but the senior section commander remained mounted and commanded the horse leaders.

It was endeavoured to preserve as much as possible the infantry uniform and equipment; but breeches were supplied to the troopers, together with boots and gaiters, and the men wore spurs.

During the campaign of 1880 in Afghanistan General Roberts formed a body of mounted infantry on the following system: Each infantry battalion supplied one officer and sixty rank and file from those most fitted for riding. To each man a pony or mule was given from the baggage train; the loads were altered so as to serve as saddles, and were furnished with leather thongs for stirrups. The soldier had in one of two bags used by the natives, and called "khujawahs," sixty rounds of ammunition, in two cases of untanned leather, thirty in each case, and in the other carried rations and gram for his horse for three days. The weight of this load was seventeen pounds. A thick blanket was placed under the saddle and fastened by a girth; the cloak was folded and attached to the saddle; nails and spare horse shoes in a bag fastened to the load were kept. A kettle was allowed to four men and was carried in a separate case. The rifle was carried by a leather strap.

These various methods of employing mounted infantry attracted the attention of the Royal United Service Institution, that well known institution which, under the patronage of the Queen and under the direction of the Duke of Cambridge, investigates zealously the questions affecting the English army and navy.

A retired officer of the Prussian Uhlaus, Capt. Lumley, who commanded with success an irregular corps of mounted infantry during the expedition against the Zulus, was invited by the committee to communicate his views on this question. The following is an extract from his lecture delivered on the 3rd of June, of last year:—

The author declares himself first of all as a warm partizan of mounted riflemen: he relates, among other things, that during the

war of 1870-71, a brigade of Prussian cavalry with which he was serving was held in check by the fire of a few African irregular horsemen, which could not have happened if this brigade had been supported by mounted riflemen. "Mounted infantry," says he, "if suitably trained can perform equally well as cavalry, the duties of reconnoitring, patrolling and of advance guards. It may be also advantageously employed for escorting and covering convoys. Mounted infantry may also be used for orderly duties. The necessity for organizing such a corps should attract attention especially in England. That kingdom does not generally engage in European wars, nor employ regular European tactics. More frequently its expeditions are carried on in tropical climates, under conditions unfavourably influencing infantry marches and the use of cavalry, which is in the English army somewhat heavy. I go further and say that the organization of the English cavalry requires the formation of a body of mounted infantry. Speaking on this subject I take my stand from the English point of view, and submit for consideration the following questions :—

"1st.—With what enemy shall we have to fight in the future ?

"2nd—Shall we have need of mounted infantry for action against this enemy ?

"In reply to the first question I may be permitted to say that there is little probability of Great Britain being drawn into a continental war in the immediate future ; but if she wishes to preserve her distant dominions she must be ready to defend them by force of arms, since their loss would entail a decline in her trade and power. In other words England will not meet an enemy in Europe, but in Asia, Africa, and perhaps in Canada. In these countries long distances have to be traversed, and an enemy encountered requiring rapid movements combined with stability. These reasons seem to me sufficient to justify the formation of a body of mounted infantry as a portion of the English army.

"As regards the second question, can we fight without mounted infantry ? I venture to reply in the negative, and that not on account of the above stated reasons, but because English cavalry in its present organization costs too much to be used as mounted infantry, supposing always that it should undertake these duties, and that it was fit for the performance of them. Although I have served all my life in the cavalry, and although I hold the highest opinion of the merits of this arm when well directed, I am compelled to acknowledge the necessity for the above stated reasons for the organization, especially in England of a corps of mounted infantry."

If Captain Lumley urges the immediate introduction of mounted infantry into the English army, he at any rate desires that these troops should be nothing more than simple infantry, and that they should not be converted little by little into indifferent cavalry ; in other words he holds that horses should only be considered as a means of conveyance

from one place to another. In the formation of such a body good rifle shots should be selected, and small horses should be given them. The ideal type of horse which should be provided is the English cob or pony. If this class of horse is considered too costly the small Hungarian or Galician horse might be purchased. India and Africa also might under favorable conditions supply such horses. Two or three weeks would suffice for their training and to render them fit for the service required of them.

The equipment should be as simple as possible; a leather wallet fastened by cross straps, to which is attached the scabbard of the sword bayonet, and two cases to hold 25 rounds of ammunition; a rifle with bayonet on the model of the Prussian Jagers would comprise the whole of the armament of a mounted infantry man; the rifle should be attached to the saddle by a hook and spring, instead of being carried by the rider by means of a strap, as experience proves that a horseman carrying his rifle in the latter manner acquires chest disease. The saddle should be a plain hunting one of the kind known as a "Cape saddle," with a high cantle. A cloak bag of unbleached waterproof canvass fastened behind the saddle would hold a change of linen, a light fatigue coat, a pair of breeches, a pair of shoes, a cap and other necessaries. Rations would be carried in a bag of the same sort of canvass as the cloak bag hung on the right side: a canvass bag might also be used to carry a load of any sort, or for spare rations. A thick blanket should be placed under the saddle: this protects the back from being galled and serves as a covering for the horse at night—a precaution as necessary in hot climates as in cold. The bridle should be strong, with a double rein, and a plain bit, which being removed would convert the bridle into a headstall.

"At the time of the expedition against the Zulus I had the pleasure," says Captain Lumley, "of commanding a body of 280 mounted riflemen. I would have wished to give you the experience which this command afforded me, but any attempt to do so would be unfortunately in vain, as my body of horse was disbanded at the very moment when they might have shown useful service. I shall never forget the day when I rode out of Durban for the Tugela at the head of my squadron of mounted infantry, or literally speaking of 'horse marines,' for two-thirds of them were run-away sailors. They saddled their horses, forming quite a small pile in front and in rear of their saddles: this caused me to think that if they succeeded in getting into their saddles there would be no fear of their falling off, but I was mistaken. Having mounted by the assistance of two of their comrades and started the horses, they began to fall off in all directions, like a herd of wild animals, and in about five minutes almost all the men had fallen from their saddles. After much difficulty we managed to reach the Tugela, when almost all the horses had sore backs, and the seats of the men were, I imagine, in a still more pitiable plight. In spite of such unpromising conditions I succeeded little by little in instilling a love of their horses into my men. I taught them to saddle and ride their

horses, and soon obtained excellent results. General Crealock, in a despatch, dated 29th July 1879, expresses himself as follows: 'I must make especial mention of Captain Lumley and his officers. Though having received his horses under very unfavorable conditions Captain Lumley has succeeded in taking a distinguished part in the campaign: notwithstanding continual reconnaissances and fatiguing marches not one of his horses has had a sore back.' Colonel Clarke also speaks in like terms of praise of the services rendered by my small detachment at the time of the constant marches for the capture of Cetewayo, and for the subjection of the tribes in the mid-Tugela.

"Thus men completely unaccustomed to riding became in a few days so used to it that they readily fulfilled the duties of mounted infantry. After a few months I parted with the greatest regret from the men who had been at first only repugnant to me.

"I conclude with the expression of the hope that the Government may recognize the necessity for the formation of a corps of mounted infantry, but I would insist on the indispensable condition that these troops should remain infantry and not become an ambiguous arm."

Lieutenant Forbes of the Madras Native Cavalry writes on the same subject in an article in the May number of the *Army and Navy Magazine*. Speaking of mounted infantry he expresses a fear lest the idea should arise of converting cavalry into riflemen, and thus sacrifice the sword to the rifle, and protests energetically against any such attempt.

This question has also been brought before Parliament, when the House of Commons refused to entertain the proposal to organize a permanent body of mounted infantry.

General Laval, when reviewing critically the English project, differs from it on radical principles.

Infantry should never change its fundamental characteristics, but various means may be adopted for its rapid transport. Whether these modes of conveyance are railways, carriages, animals, boats, balloons, &c., is a matter of no consequence. All the above may be made use of at times: they increase mobility but are not means of fighting. A soldier must be before all a good shot and a good marcher: he must make up his mind to do without carriages to march on foot, and always to fight on foot. His whole time should be devoted to infantry training, and should not be diverted to learning horsemanship, or seamanship, or rowing in boats, &c.

The addition of horses to infantry soldiers leads by degrees to the predominance of the cavalry element. They first become indifferent cavalry and indifferent infantry, and then, after a time, may be converted into good cavalry. Not comprehending past lessons and the teachings of logic, fresh attempts may be made, but they will lead to the same negative results; better far to avoid superfluous expense and certain failure.



A permanent establishment of horses entails lessons in horsemanship, a special uniform equipment, armament, a system of remounts, and a considerable outlay.

Long marches are a question of transport, but not of horsemanship. The strength of animals is used to add to the powers of infantry. Let the men only keep to them and it will be sufficient: they will always prefer being carried to the fatigue of marching. Habit will necessarily be the best instructor for the infantry soldier. All horsemanship training is superfluous; once commenced, it will lead to being immersed in the lessons of the riding school, in learning to leap, and to charge. All this is useless, as also the practice of various kinds of manœuvres. The infantry soldier when mounted should simply follow his officer, and the non-commissioned officers would keep the ranks closed up: more is not necessary, the above requirements are sufficient.

General Wood (see above) without doubt goes too far. His special permanent corps of infantry mounted on horseback are no other than cavalry selected from infantry soldiers. With reference to this no necessity has been shown, for example, for any special organization for the corps serving in Algeria, Zouaves, Turkos and Foreign Legion: they have been mounted on mules, asses, horses, and camels, and the men have received no riding training, wear no special uniform, and yet have performed successfully long marches.

A column which left Sain-Sifar on 31st May 1882, marched 180 miles in two days in order to reach the camp-ground of Bu-Amen. A column marching from El-Arik accomplished 110 miles in 59 hours (three days and three nights). A hundred men of the Foreign Legion, on mules following some squadrons of cavalry accomplished 140 miles in three days, or an average of 46 miles a day.

Other facts might be adduced to prove the possibility of conveying infantry without any preparatory training in riding. A reference to the meeting of the London United Service Institution will show the awkwardness of infantry soldiers on horseback, their falls, and the sore backs that result from continual marches; but this lasts for only a few days. Awkwardness on horseback raises a smile only when it is wished to manœuvre, march past, or perform parade movements,

In India General Roberts, as already stated, selected from each battalion 60 men and an officer from those most used to riding. He had a certain amount of success in a practical sense in his mounted infantry; but the cavalry element prevailed even here with its attendant evil results. Wallets, bags for horse shoes, kettles, extra rations, grain—all these form the impedimenta of cavalry, but mounted infantry have nothing to do with these, as its characteristic ought to be mobility, or rather we should say rapidity. Attaching the cloak to the cantle of the saddle is a mistake. It should be worn round the shoulder, so that the soldier on alighting at the first signal may have on his own person all his property, may take up a position, open fire

without delay, advance, turn to a flank, follow in pursuit or halt, without any anxiety for his horse or what is on it.

The horse is the stumbling block in all these systems. Some recognizing this have proposed to form companies mounted on mules. Mules are preferable to horses, inasmuch as they remove the temptation of the riding school and leaping bar, and thus attention can be seriously given to rifle practice.

Nevertheless the ideal is not contained even in this system : special companies are not suitable. To wish to have cobs, ponies or mules, with a special equipment, and to undertake the labor in time of peace of purchasing thousands of animals to feed and keep them for nothing, what a needless expense without the least gain ! The object to be obtained is simply to convey infantry long distances without fatiguing them, and for this purpose both horses, mules and asses may be employed. Mobility is obtained by steady progress and not by rapid movement. The one thing necessary is not to fatigue the men. Any suitable animal may be utilized from among those unfit for cavalry, artillery or the baggage train. These will be found in sufficient number, and requisitioning will be the only possible means of supplying remounts.

The animals would be used for saddle or pack purposes according to the class supplied by requisition. It will be unnecessary to trouble oneself about the saddle gear : the men will manage that. A regular bridle is not required, a plain snaffle or head collar will suffice. A horse moving in a string does not require guiding ; it will follow the movements of the others.

Animals entertained permanently in a body require equipment, rations, shoes, forges, shoeing smiths, farriers, saddle-makers, harness-makers, &c. If it should be required to leave any of them behind, servants must be appointed for the care of the equipment, and in these changes operations are delayed. This constant work deprives the infantry soldier of his chief value. Requisitions have the advantage that the horses, &c., are procured on the spot ; they can be changed on any occasion, and when required no longer can be abandoned.

Animals obtained on requisition require no special equipment or shoes ; they are shod when opportunity offers. They go as far as they can, and if they fail they can be left behind or destroyed. At halts they can be tied to trees, or fences, or hobbled with their halters. The men and horses eat what they can get and carry nothing superfluous. If they find forage the animals eat their fill ; if not they are let loose to graze ; grass, straw, green leaves, the bark of trees suffice for them. In this way two or three days may be past ; fortune being favorable, and if the detachment is not too large, there will always be a possibility of their finding subsistence.

Requisitions for animals are generally possible if recourse be had to them in good time. It may be assumed that means will be found for the

conveyance of infantry in greater or less numbers without expense, without trouble or difficulty. This is the practical mode of action, since a body of mounted infantry specially organized would be as expensive as cumbersome a method, for in the end they would become, only under another name, regular cavalry. In such a case it would be much better to increase the existing numbers of squadrons of cavalry regiments.

The question of mounted infantry aroused especial interest in England on account of the extent of her colonial possessions. Writers and meetings of experienced professional men warmly advocated their permanent formation. Practical men were not allured by the speciousness of the arguments adduced. When the question was discussed in Parliament, the war minister replied: "We have decided to keep in store the necessary material for the equipment of mounted infantry. We wish to be able, on occasion, to mount a certain number of infantry soldiers, but we do not entertain the view of a permanent organization of such a corps."

This is the true practical conclusion of the question, but a store of material is superfluous.

#### NOTE BY THE TRANSLATOR.

The above translation has been made, not on account of any very original ideas contained in the article, but rather to show the interest taken in this subject by the foreign military press, and in the hope that the knowledge of this fact may serve as a stimulus to ourselves to arrive at a definite solution of this question, the importance of which has been recognized by our most eminent practical soldiers for so long a period.

The general principle insisted on in the above article, that any body of mounted infantry should retain all the characteristics of infantry, and should usurp none of the functions of cavalry of the line, is I think accepted by all who have given practical attention to the subject. That a certain amount of special training is, however, necessary is pretty clearly demonstrated by Captain Lumley's graphic description of his first ride from Durban; but this training should not go beyond that of teaching the men how to clean, feed, saddle, ride and shoe their horses or other animals supplied them for transport. The amount of riding taught should be of the most elementary description and free from all purely riding school regulations.

As in other practical military questions India supplies the best possible field for the solution of this question. Regiments are at war strength, and transport animals of all sorts are available for training at a very slight extra expense. Camps of exercise and field manœuvres on a more or less extended scale take place annually, and I would beg to earnestly urge the advantage of utilizing them as experimental fields for the decision of this and the many important tactical questions awaiting solution.

The following system might be put into practice at once and tested during the coming drill season at a merely nominal cost: Let each battalion of British and a proportion of Native Infantry be supplied with, say, ten transport animals, either horses, mules or camels: the former might be cast cavalry horses, and the latter could be supplied by the Transport Department. These should be made over to the Captains of Companies for the time during which their Companies are struck off duty in accordance with H. G. G. O. of 1st April last. A non-commissioned officer of cavalry might be attached to the battalion during the period of training. The duties of the latter should be confined to teaching the elementary rules of riding, saddling, and the general treatment of horses. The equipment might be that of the mounted infantry employed in Zululand, and would of course be handed from one Company to another. For camels, Colonel Ross' Camel Corps might serve as an example. The men trained as above should be formed into a Brigade or Divisional Corps on all occasions of field manoeuvres and one or two selected officers appointed to command them.

SECUNDERABAD, 1st June 1883.

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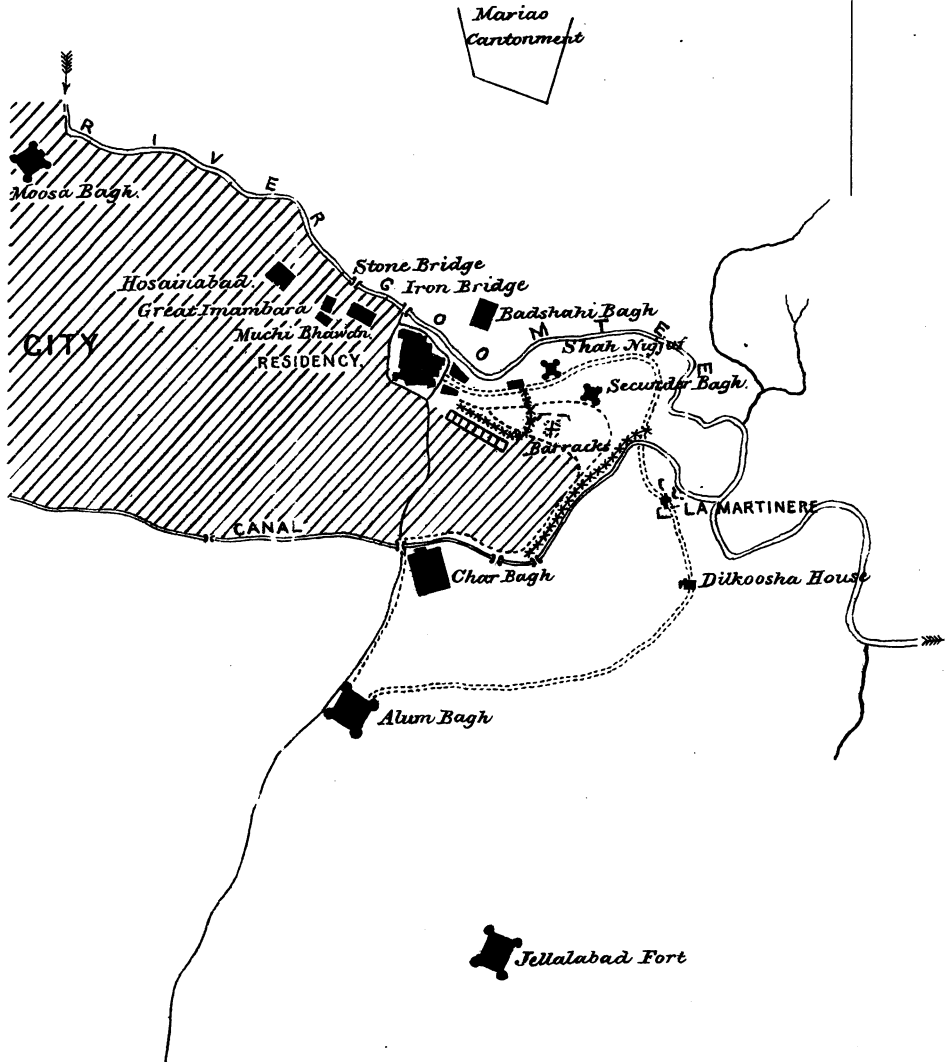




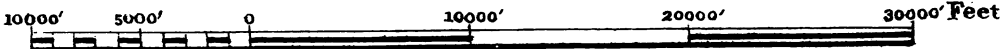
# GENERAL MAP OF LUCKNOW

## REFERENCES.

*Havelocks Relief shewn thus* -----  
*Lord Clyde's " " "* -----  
*Enemies lines of defences in* } \*\*\*\*\*  
*March 1858.*



Scale of Feet.



## VII.

### THE DEFENCE OF THE LUCKNOW RESIDENCY.

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[Lecture delivered in the Hall of the United Service Institution of India on Tuesday, 28th August 1883, by Colonel J. J. McLeod Innes, V.C., R.E.; H. E. Sir Donald Stewart, Bart., G.C.B., &c., &c., in the Chair.]

NOTE.—*Some of the concluding details were, owing to the want of time, omitted in the lecture as delivered.*

THE subject of to-day's lecture is the Defence of the Residency of Lucknow, the first of that series of operations which has caused Lucknow to occupy so prominent a place in the history of the war of the Mutiny of 1857.

The siege of Delhi was unquestionably the grandest episode; its storm the most brilliant feat; its capture the crisis, the turning point of that war. But Delhi was taken in September, whereas Lucknow was, without cessation, the seat of important operations from the very beginning of the outbreak until the following March, when its capture by Sir Colin Campbell struck the deathblow to the sepoy cause, at least in Upper India.

That continuous struggle at Lucknow, of ten months' duration, from May 1857 till March 1858, consisted of six perfectly distinct operations :—

1st.—The defence of the Residency which, with its preparations, lasted for about 4½ months, was contemporaneous with the siege of Delhi, and ended with the second operation.

2nd.—The arrival of Outram and Havelock to the relief of the Residency on the 25th September.

3rd.—The second defence by the combined force, which lasted for about two months.

4th.—The relief by Sir Colin Campbell and the evacuation of the Residency position at the end of November.

5th.—The occupation and defence of the Alum Bagh, by Sir J. Outram for three months, December, January and February.

6th.—The attack and capture of Lucknow, and the dispersion of the Sepoy Army in March 1858.

The first of these six operations is our special subject, but it will not be out of place to give a brief outline of the whole series. As the defence of the Residency will be described in detail, all I need say about it at present is, that the troops there mutinied on the 30th May, and the siege of the Residency began a month later, on the 30th June. It lasted for 87 days, nearly three months.

But within three weeks from its commencement, the efforts of General Havelock to relieve it had begun. He crossed the Ganges on the 21st July, and twice advanced towards Lucknow. But the smallness of his force, and the spread of cholera, each time forced him to halt, and he



had eventually to recross the Ganges to Cawnpore on the 13th August. A month later, Outram joined him with fresh troops, and about the 20th September they marched to the relief. On the 23rd they reached the Alum Bagh. There they arranged to leave a rear-guard, and on the 25th they advanced and reached the Residency. Their route was, as shewn on the map, along the high road as far as the Char Bagh on the canal, whence, instead of going onwards along the direct road which they knew to be blocked and defended, they turned to the right, skirted the canal, and proceeded along the line marked, to the Moti Mahal. Thence, after a short rest, they made a rush to the Residency, in the face of a furious fire, which more than decimated the force, causing it a loss of 500 men.

But this relief proved to be only a reinforcement. The enemy were too strong to be driven off. A succession of sorties for the first ten days failed to succeed in opening out any of the roads, and then the original garrison and the relieving force settled down for a second defence in a considerably extended position.

Delhi had fallen before this relief occurred, and now a portion of the army that had taken Delhi and the troops that had been diverted from the China expedition combined at Cawnpore, and advanced thence in the middle of November, under Sir Colin Campbell, to the second relief of Lucknow. From the Alum Bagh, instead of proceeding along the route taken by Havelock's force, they turned to the right, kept outside the Canal, and from the Dilkosha struck to the left along the river bank, and so, after hard fighting at the several palaces and gardens along the line, reached the Residency on the 17th. Sir Colin decided on removing the garrisons and evacuating the Residency. This was accordingly done after a few days.

But Sir J. Outram was left at the Alum Bagh with a force of about 4,000 men to hold on to Lucknow; and there he remained for three months, having constant conflicts with the Sepoy Army, who meanwhile fortified Lucknow against the coming attack, whilst Sir Colin was clearing the surrounding country.

Finally, in the beginning of March 1858, Sir Colin re-joined Outram with two fresh divisions and a large force of cavalry, and a few days later Jung Bahadur also arrived with a Nepaulese Contingent. The enemy had constructed three lines of defences, as shown on the map—the first along the canal up to the river—the second from the Moti Mahal to the palaces east of the Kaiser Bagh—the third along the face of those palaces and the Kaiser Bagh. Sir Colin sent Sir J. Outram to the north bank of the river, whence the two first lines of defence were turned; and in ten days he drove the whole rebel army out of Lucknow and dispersed them.

This sketch will serve to shew how continuous, important, and interesting a part Lucknow played in the war; but the defence of the Residency, besides having specially interesting features of its own, which I will endeavour presently to describe, had also its own peculiar importance, in that it was the sister event to the siege of Delhi, and aided our

operations there most materially by keeping attracted to itself a powerful force of from 20,000 to 25,000 men, which otherwise would have formed a most serious and dangerous addition to the already almost overwhelming odds against which we were contending at Delhi.

But what was it that led to Lucknow, more than any other place, becoming the special seat of war? I believe it was this. In the long interval of 1,000 miles between Meerut and Calcutta, there were at the outbreak only three British regiments—at Agra, Lucknow, and Dinapore respectively. At Agra there was one fight, but the fort there was too hard a nut for the mutineers to crack, so they left it and went to Delhi; and Dinapore and the southern districts up to Allahabad were quickly strengthened by our reinforcements. At Lucknow only was there a British garrison left, which seemed so weak and so weakly placed as to be likely to be easily crushed, besides holding out the additional bait of a large amount of treasure, some quarter of a million, which it had in its keeping. The native force, also, in the neighbourhood was so large, owing to Oude having only recently been annexed, as to form a compact army by itself; the province was filled with discontented men, checked in their career of rapacity and license and ready for disturbance, and the population generally was one accustomed to a chronic state of anarchy and strife. This accounted for the siege of the Residency, and, after the fall of Delhi, the rebel army came pouring into Oude, the natural home of most of them, and, finding Sir James Outram holding on to Lucknow, accepted it as the battlefield for the great struggle.

I turn now to the defence of the Residency, and first of all to the events that preceded it. It was well for us that when the outbreak occurred we had at the head of the Government of Oude a man of such a character as Sir Henry Lawrence. He had arrived only a few weeks before it, when the country was much disturbed, and a young civil officer, Mr. Boileau, had been killed, but even those few weeks had enabled him so to influence the leading natives of the province as to affect materially their bearing towards us. Two facts will suffice to illustrate this. With the exception of two or three whose residence was too near Lucknow, they held aloof as long as they could from joining in the siege, and did not send their retainers against us till Havelock, as I have described, recrossed the Gauges to Cawnpore; and, what was of more importance, they gave us material assistance during our six weeks of preparations in the ceaseless pouring in of food and supplies, the collection of which formed one essential element of the success of the defence.

But Sir Henry's chief characteristic in reference to the defence was his foresight. Assured from the first that serious events were at hand, he was arranging his plans and making preliminary preparations for some time before the outbreak occurred. He was given the chief military command, as well as the charge of the civil administration, and accordingly, on receipt of the news of the mutinies at Meerut and Delhi of the 10th and 11th May, he altered the disposition of the troops. Till then the British Regiment had been in barracks to the

east of the Residency, and the native troops had been in the cantonment of Mariaon to the north. He now placed a detachment of the British Regiment, the 32nd, and of one of the Native Regiments, the 13th, which he had selected as worthy of trust, at the Residency, and another in the Mutchi Bhowm, an old native fort which overhung the city, and moved the greater part of the 32nd to the Mariaon Cantonment. His plan was to hold these three posts or positions :—

- (1.) The Cantonments to keep the roads open.
- (2.) The Mutchi Bhowm to command the city and to serve as an *entrepôt*, and if necessary a place of refuge.
- (3.) The Residency, which was to be fortified and prepared for the serious struggle which he felt to be impending.

He had considered the idea of removing the families and concentrating on Cawnpore, but had decided against it as impracticable, and only certain, if attempted, to precipitate the crisis.

The question really in doubt was what position in Lucknow to select for the defence? He has been condemned by some for selecting the Residency. But at any rate it had these advantages: it was the most easterly position where the requisite amount of accommodation could be provided in a compact shape: any more westerly position would have been difficult of approach to a relieving force, as the ground to the east did not consist of dense city and streets, but of a plain dotted over with palaces and gardens; and the site was healthy, well supplied with water, and on a spur which, on two sides, one of them the river face, made it dominate the adjacent ground.

In pursuance of these plans, then, on receipt of the news of the outbreaks at Meerut and Delhi, the troops were redistributed as I have described; the defences of the Residency were begun; and the Mutchi Bhowm, besides being strengthened and garrisoned, began to be rapidly filled with supplies and ammunition. A fortnight later, on the evening of the 30th May, the greater part of the native troops mutinied, the 13th Native Infantry and the Sikhs alone remaining faithful. I need not describe the scene—suffice it to say that the Brigadier and another officer were killed; but the sepoys were intercepted, and prevented from moving on the city; and in the morning they were attacked and driven off into the country.

Among the precautionary measures taken by Sir H. Lawrence were the following :—

- (1.) The old native Arsenal at Hosseinabad in the city was cleared of everything likely to be of use to ourselves, or dangerous if left to the enemy; a number of perfectly useless wall pieces and the like being at the same time taken and distributed along the parapets of the Mutchi Bhowm, inducing in the city the report that it was armed with 300 guns.
- (2.) Natives of position, who were or might become dangerous, were made State prisoners, and assigned quarters either in the Mutchi Bhowm or the Residency.

(3.) Some 600 of the troops who had remained staunch were selected for retention, and about 100 pensioners were called in from the outlying districts.

(4.) The food for the native troops was from the first placed under the charge and supervision of selected native officers of high caste and character.

The troops having mutinied, the eventuality of a siege became certain, but it was quite uncertain what shape it would take or when it would begin. The preparations for it in the Residency were—

1st.—The construction of defences.

2nd.—The clearance of the surrounding ground.

3rd.—The preparation of the place and buildings for residence, and for the storage of supplies and ammunition.

The defences naturally progressed homogeneously, *i.e.*, the whole position grew stronger by degrees, and equably everywhere. One point was not first fortified and then another. The process was somewhat of this kind. Doors and windows looking outwards were barricaded, then the walls were loopholed, the roads or lanes leading out from the position were then blocked up by walls of earth or other material, a continuous line of defence was thus created, the compound walls were then thickened and raised, and trenches and ditches excavated, the parapets which were thus formed were enlarged at some points, and at others batteries were constructed such as the Redan and the Cawnpore Battery. So that, when the siege began, there was a continuous line of defence, but none of the batteries and their accessories were really finished. As emplacements were prepared, guns and mortars were placed in position.

The clearance of the neighbouring ground was not equally progressive. Obviously the nearest buildings and the most commanding buildings should have been the first to be demolished, but this was not done, and one building, Johannes' House, not 20 yards from our defence, was unfortunately left standing, to be the source of much mischief till it was undermined and blown up.

As to storage and preparations for residence, I may mention that rooms for the residence, in a very crowded way, of all who would require shelter as well as the garrison, were cleared out and prepared so carefully that the number of casualties among non-combatants from the enemy's force were but few after the first two or three days. The food that came pouring in from the country, and which was first stored in the Mutchi Bhowm, was eventually nearly all removed to and lodged in the Residency position. But shelter was still wanting for a large quantity of powder that was stored in the Mutchi Bhowm, and which consequently had to be blown up. One of the precautionary measures against sickness was the storage and distribution of large quantities of lime and charcoal. One of our anxieties was the safe custody of the Government Treasure, some 20 lakhs.

This was provided for by burying it and building a battery over it. Finally semaphores were erected on the roofs of the Residency and the Mutchi Bhowm for the interchange of signals.

Such then were our preparations.

The mutiny at Lucknow on the 30th May was followed in a few days by mutinies at all the outstations of the province. Numbers of refugees, escaping from them, came to Lucknow and found shelter in our entrenchments. The mutinied troops deliberated for some time what to do, but by the end of June it was known that they were collecting and concentrating towards the north-east.

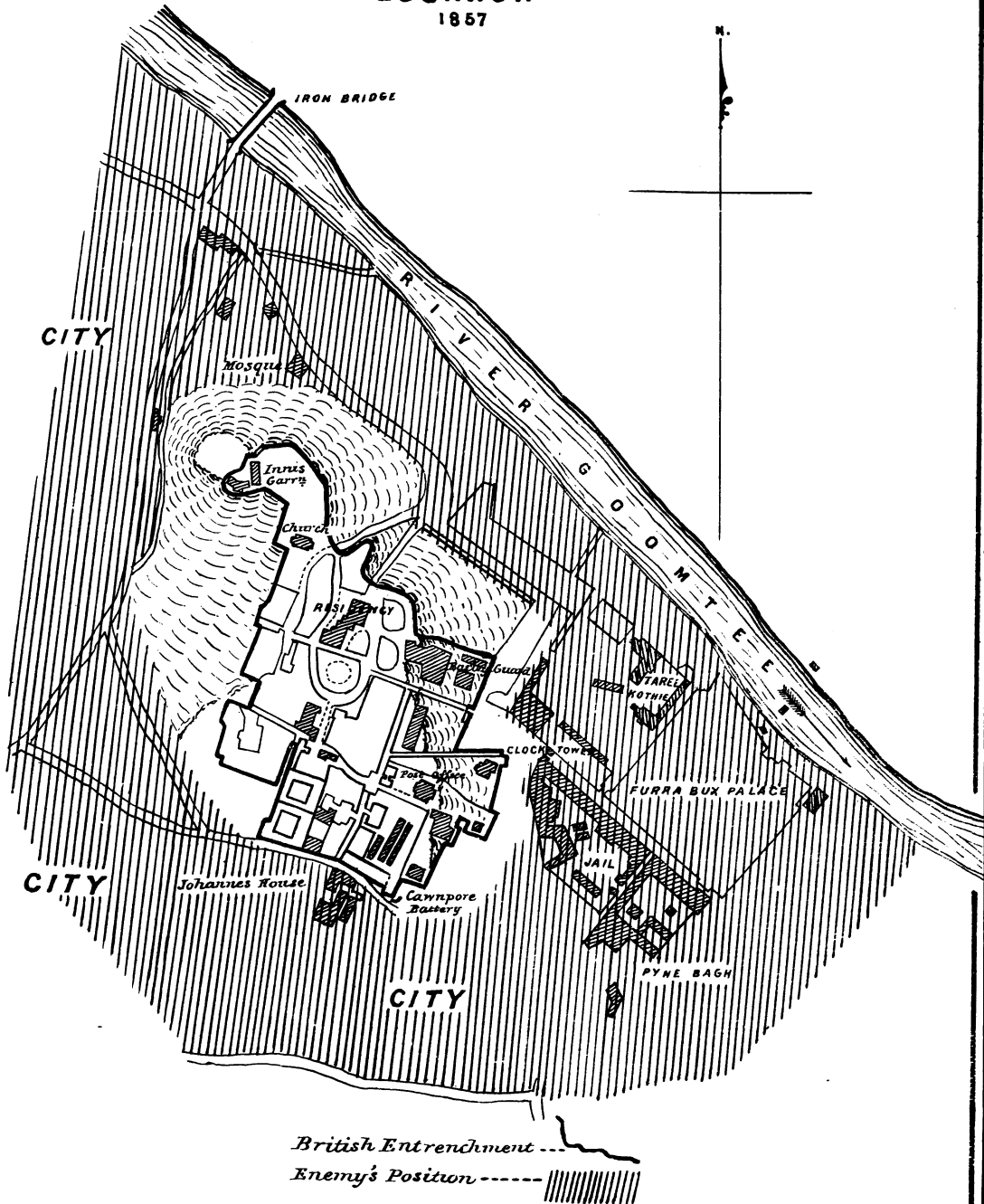
On the 29th it was reported that their advanced guard would be at the village of Chinhut, a few miles out, on the Fyzabad road. To keep the country open any longer would be impossible. So Sir Henry withdrew the troops, that evening, from cantonments; and next morning took out a small force to attack what was supposed to be the advanced guard of the enemy, but which proved to be his whole army. I need hardly describe the fight of Chinhut. Our force was overwhelmed and outflanked by superior numbers, and retreated into the Residency, leaving 4 officers and 100 men dead on the battlefield, and closely pursued and followed up by the enemy.

We were still holding the Mutchi Bhowm, so that, during the course of that day, the sepoys, crossing the river at several points, gradually surrounded and hemmed in the Residency and cut off the Mutchi Bhowm from it. The organization of arrangements for defence against an immediate assault absorbed Sir Henry's attention for the time. But no such assault was made, and next morning he signalled orders to the Mutchi Bhowm to withdraw at midnight to the Residency and blow up the Magazine. The preliminary preparations for this move were made silently and secretly, and open and active steps were not taken till evening. All the guns, except three, were collected near the eastern exit, and, as the native gunners and drivers had disappeared, their horses were ridden by officers. Lieutenant Thomas of the Ordnance Department prepared the magazine for explosion. The mortars of the Mutchi Bhowm and of the Residency shelled the intervening ground at intermittent periods the whole afternoon and evening. Precisely at midnight the leading company of the 32nd marched out, and moving rapidly, the whole of the Mutchi Bhowm garrison, a compact little body, expecting to have to fight every inch of ground, reached the Residency to their amazement without having seen an enemy or had a shot fired at them, and five minutes afterwards, a heavy shake of the ground, a blaze of light as of daytime, followed by intense darkness, proclaimed the explosion of the Mutchi Bhowm Magazine.

Sir Henry Lawrence accepted this successful concentration as a happy omen for the defence to which we now settled down.

The map shews the position which we held. The thick black line indicates our continuous outer line of defence. The shaded space out-

PLAN  
of the  
ENTRENCHED POSITION  
OF THE  
BRITISH GARRISON  
AT  
LUCKNOW  
1857





side it is the ground held by the enemy. The intervening space was all that separated them from us, narrowed, you will observe, in some places to the width of an ordinary city street. The shape of our position was an elongated square. Its greatest length, from Innes' post to the Cawnpore Battery was about 700 yards, its greatest breadth about 400 yards; its perimeter was about a mile; and its area was about 32 acres.

Its outer line of defence consisted of a series of consecutive posts, *viz.*, beginning with the Baily Guard Gate as its old name used to be.

|                                   |                               |
|-----------------------------------|-------------------------------|
| The Treasury post, which held it. | The Sikh Square.              |
| Fayrer's post.                    | Gubbins' post.                |
| Saunders' post.                   | A line of Commissariat posts. |
| Sago's post.                      | The Church.                   |
| Germon's post.                    | Innes' post.                  |
| Anderson's post.                  | The Redan Battery.            |
| The Cawnpore Battery.             | Langmore's post.              |
| The Martiniere post.              | The Hospital.                 |
| The Brigade Mess.                 |                               |

From the Church, round by Innes' post and the Redan to the Hospital, our position commanded the ground in front. So did Fayrer's post. But the other posts were virtually on a level with the opposing positions held by the enemy. Saunders', Sago's, and Germon's posts were supported by the Post Office post on high ground in their rear. Except where the walls of the houses or buildings formed the defence, our line of defence consisted simply of the ordinary walls of the compounds, (or enclosures), raised and thickened, with the exterior ground at their feet hollowed out like roadside ditches to increase the height to be overcome by any attacking party. But only on the river face was this height such as to present a serious obstacle to the enemy.

That face was well flanked by the Redan Battery and flanked it in its turn. The Eastern or Baily Guard front was flanked from the Post Office, the posts below it having no flanking defence except from their own indented trace.

The southern face had no flanking defence except from the Cawnpore Battery, which was itself under so heavy a fire as not to be depended on for such assistance. Gubbins' southern face was flanked from the Sikh Square. The whole of the western front was flanked from Innes' post, and was the one least attacked during the siege.

Retrenchment barricades were thrown up in rear of all the dangerous points—the Cawnpore Battery, the Baily Guard Gate, the Redan Battery, Innes' post, and the like.

Only a few guns were placed in position in the Redan, Cawnpore, Post Office, and similar batteries. The rest were at various points on the edge of the higher ground and at flanking points. The mortars were pretty evenly distributed round the higher ground of the position.



When the defence began, we numbered about 3,000, viz. ;—

|                                                  |     |       |
|--------------------------------------------------|-----|-------|
| Officers about                                   | ... | 130   |
| British Non-Commissioned Officers & men          | 740 |       |
| <hr/>                                            |     |       |
| Total British Troops                             | ... | 870   |
| Civilian Volunteers                              | ... | 150   |
| <hr/>                                            |     |       |
| Total British Combatants                         | ... | 1,020 |
| Native Troops about                              | ... | 700   |
| <hr/>                                            |     |       |
| Total fighting men about                         | ... | 1,720 |
| Women 237, children 266, boys 50, other European |     |       |
| non-combatants, say 27                           | ... | 580   |
| Non-combatant natives about                      | ... | 700   |
| <hr/>                                            |     |       |
|                                                  |     | 3,000 |
| <hr/>                                            |     |       |

Of the combatants, a detachment of 50 men were told off as a reserve, never to move except by the personal or written orders of the General or his Adjutant-General, and there was only one occasion when they had to be called out. Still even this detachment was reduced to half its strength by the end of the siege.

The remainder of the combatants were almost all distributed to form the permanent garrisons of the posts I have named. The commanders and men of these garrisons never changed, and were never allowed to leave their posts except under most stringent rules. The result was that they thoroughly mastered the details of their respective posts, their strong points, their weak points, and the aspect of every bit of ground or building which they faced; and so detected at the earliest moment any new bit of devilry which the enemy might be devising near them.

The principal look-out on the enemy's movements was from the Residency. At first there was another look-out from the Church, but this was stopped after two of the men had been killed by round shot. But from the Residency there was a constant look-out, with reports every hour.

The non-combatants were all distributed among the lower storeys of the buildings in the interior of the position, and also in those of the more secure garrison posts as the Post Office, Brigade Mess, Gubbins', and Fayrer's posts.

The whole of the Commissariat stores and cattle were arranged on the western face of the position; the distribution of the supplies was organized from the first day; and every man, woman, and child, European and native, was rationed as precisely, garrison by garrison, building by building, as a regiment or battery is rationed in times of peace. One member of each garrison was told off for the duty, presented his daily state and indent, received the prescribed rations, and took them off to the cookhouse of his post.

Such servants as remained received their rations like all others but were expected to do general duty in the respective posts, and not merely attend on their own employers.

Such, briefly, were the arrangements under which our defence was conducted, and I now proceed to its events.

The first incident that occurred, on the very first day of our concentrated defence, was the inexpressibly sad one of our chief, Sir H. Lawrence, receiving his mortal wound from the bursting of a shell. He lived long enough to give his dying injunctions—surely, model injunctions for the case: “Retrench, retrench, retrench, shelter the women and children, do not expose the men. Every man we have will be needed. Never give in—fight to the last—never think of surrender.”

These words were felt to be but the fitting bequest—an invaluable legacy—from him to whose sagacity, foresight, energy, and influence we owed our lives and the possibility of making the fight with any chance of eventual success. This fight—this defence—lasted 87 days, or slightly over 12 weeks, and is divisible into four periods of three weeks each, the first three periods ending each in a general attack all round, and the fourth in our relief by Outram and Havelock.

During the first three weeks there was no actual attack made on us. But there was a ceaseless fire kept up on the position, and the time and attention of the garrison were devoted, besides the vigilant and constant watch necessary everywhere, to the improvements of the defences, the repairs to damages, the moving of stores and ammunition from exposed to safer posts, burying dead horses and cattle, and the organization and execution of work necessary for the conservancy and sanitation of the position.

For the first week our anxiety was intense as to any signs of military knowledge or skill on the enemy's part; and our relief was proportionate when none such appeared. Still the havoc which the enemy's fire made among us in spite of all efforts to keep under cover, its effect on our defences and buildings, the constant exposure to the fierce July sun and to the heavy rains of the monsoon, the perfectly impervious position of the enemy, secreted in or behind the surrounding buildings, our absolute isolation from the surrounding world, the entire absence of intelligence of any kind, and the feeling of deadly suspense till we should test the enemy's strength in his first serious attack—made those first three weeks of the siege its most trying period.

At last, on the morning of the 20th July, the look-out reported an unusual amount of movement of troops all round. The garrisons were ordered to be specially on the alert. The parapets were lined—the guns were manned—and all was ready; when a mine was exploded by the enemy outside the Redan, the signal for a general attack. A rain of fire was poured in from the artillery in every direction and of musketry from all the surrounding houses, and columns of attack rushed at the Redan and Innes' post on one front, and at the

Cawnpore Battery, Anderson's and Germon's on another. At the two last, which they knew they had not breached, they brought forward scaling ladders. At the Redan, they had evidently expected to find an open breach made by their mine, but it had been only half the necessary length and in a wrong direction, and so had exploded innocuously in the open neutral ground.

The leaders and heads of the attacking columns were met by fire in front and flank, and swept down, and forced back to their own lines. They continued to make desultory efforts at fresh attacks, but these were futile, though the heavy converging fire on the position was kept up for several hours, and did not die away, or rather decrease to its normal state, till the evening.

So ended the first and greatest of the assaults ; and I can hardly describe our consequent exhilaration, feeling, as we then did, that, barring a surprise, we could certainly hold our own against such efforts and such an enemy. Our losses during the attack itself were not heavy as the men did their best to keep under cover ; but later in the day, when the attack was felt to be at an end, they exposed themselves carelessly, and many lives were lost in consequence.

The mine at the Redan inaugurated a new phase in our operations. We had, of course, thought of mines from the first ; but had decided to take no overt action until it should be forced on us, and, in the meanwhile, merely to watch and guard against them. Now, however, that the enemy had taken the first step, we commenced active protective measures. The means at our disposal were scanty compared with the unlimited amount of labor which the enemy could employ. As it was, with the aid of half-a-dozen old Cornish miners in the 32nd, the garrisons of the outposts sunk shafts and drove out galleries for protective mines at the most exposed positions, such as Saunders', Anderson's, the Martiniere, and Brigade Mess.

The next three weeks were spent on these mining preparations, in occasional sorties to discover what the enemy were after, and in, as before, repairing damages and doing every sort of manual work, however hard and abominable, which the needs of conservancy and sanitation demanded. During these three weeks we received, first on the 23rd July and then on the 6th August, intelligence of Havelock's arrival at Cawnpore, his crossing of the Ganges, and the difficulty he met with in advancing further. Still the fact of the presence of British troops at Cawnpore was now certain, and this alone brightened our situation and prospects.

At the end of this second period of three weeks, on the morning of the 10th August, similar movement and signs to those of the 20th July were reported from the look-out ; and, as before, a general attack all round began with the explosion of a mine ; on this occasion there were two mines, one aimed at the Martiniere on the south front, the other at Sago's on the east front, both of them short of their mark and innocuous. Attacking columns came rushing forward after these explosions, one

against the Martiniere and Cawnpore Battery, and the other against Sago's and Saunders' posts. The unbreached defences and obstacles of the Martiniere and Cawnpore Battery, with the fire they met from the Brigade Mess, were too much for the attacking force in that quarter. At Saunders' and Sago's too they were met and checked both by the direct fire from these posts and the supporting fire from the Post Office; but they clung tenaciously in small bodies the whole day to the attack on this quarter, and began a fresh mine against Sago's. But they were vigorously countermined, and next day their mine was destroyed, and the enemy cleared out of the positions they had tried to hold.

Besides attacking at the two positions which they had endeavoured to breach by mines, the enemy also tried to escalate and storm at Gubbins' and at Innes' posts; but here, as before, the leading sections were swept down by fire from front and flank and forced to retreat with heavy loss.

This ended the second attack, confirming our impression of the inability of the enemy to succeed in any such efforts.

But they continued their endeavours to effect a breach by mines most persistently, and now seemed to concentrate their efforts on the south front, the one most undefended by flanking fire. Two mines which they began were met and stopped; but a third, which had been undetected, owing to the stamping of the horses of the Sikh cavalry, was exploded on the morning of the 18th in the defences of the Sikh square, making a practicable breach in them. This success seemed to take the enemy by surprise. There was no general assault all round the position, but a storming party dashed at the breach. As on former occasions, its leaders were met by fire on front and both flanks, which swept them down and checked the attack. For the first and only time, our reserve (of 50 men of the 84th) were called out in case matters should become more serious; but, though the enemy's fire continued heavy, they failed to make any entrance by the breach or lodgment on it, and we gradually closed it by barricades, constructed from its flanks inward, sap fashion, by doors and planks pushed forward and erected on end, and earth thrown up behind.

The enemy may have been emboldened to make this attack, so soon after their repulse on the 10th August, by the knowledge that Havelock had recrossed the Ganges to Cawnpore.

But this successful mine shewed the necessity for a counter-stroke. This, the south front, was our weak one, and one element of danger and mischief, both through facility for mining and for sharpshooting, was Johannes' House. On the evening, therefore, of the day on which this breach was made in the Sikh square, we started a mine to blow up Johannes' House. It took three nights to carry out. On the evening of the 20th, it was reported that it would be ready early next morning. Accordingly, all being ready, the enemy were enticed into the building; it was blown up, and parties, which sortied at the same time, and, as was expected, found the enemy paralyzed by the explosion, seized

and blew up some of their adjacent buildings which had been left standing, and thus diminished their cover for mining and for sharpshooting.

This successful and effective blow, besides securing this absolute gain, greatly disheartened and cowed the enemy as we afterwards ascertained.

Still they went on mining, and we, on our part, kept gradually extending our protective mines at Anderson's and other weak points of our position.

Towards the end of August signs appeared of Saunders' post becoming the site of attack. The enemy began mining hard at it, three mines being driven towards it in succession; the first was met and stopped, the second was blown in, the third we broke into and blew up. Work of some sort or other was also observed to be in progress opposite it and the Baily Guard Gate. We conjectured that they were building a battery; so our native garrison of the Treasury post, beside the Baily Guard Gate, began and constructed a counter-battery for two 18-pounders, dragged the guns down to it, and armed it all by themselves unaided. This battery was completed, and the third of the above mines at Saunders' post had been defeated on the morning of the 5th September, when the same signs of movements of troops, as on the two former occasions, were reported from the look-out, and the third and last general attack all round began by the blowing up of a mine aimed at the Brigade Mess, and by the unmasking of the battery which we had rightly supposed the enemy to have been building opposite the Baily Guard Gate. The attack at this point, on the east part, was quite futile; their mine there had been destroyed, and their new battery was speedily crushed by our new 18-pounder battery. At the Brigade Mess, their mine fell short of its mark; still storming parties came on there, and at the adjacent Sikh Square and Gubbins' post,—at the latter place with scaling ladders; but they were, as formerly, steadily met, checked, and repulsed.

It was remarked at the time that the men in the assaulting columns seemed new to the work and ignorant of their ground; and subsequent enquiries tended to shew that it was about this time that the feudal retainers of the talookdars of Oude first joined in the operations against us.

After this attack, we were but little molested in comparison with the past. But there had been absolute stoppage or cessation of communication with the outside; and this silence and our consequent ignorance of what was going on elsewhere were causing the deepest anxiety. We had plenty of grain and flour; but our animal food was getting exhausted; our numbers, *i.e.*, the numbers of our fighting men, were greatly reduced, and the physical strength and health of the survivors was at a very low ebb, and there was now superadded the likelihood that the native troops with us, who had hitherto remained staunch, would give up all hope of relief and would desert.

Now, too, occurred our greatest loss next to that of Sir H.

Lawrence. Captain Fulton of the Engineers was killed by a round shot on the 14th September. Not only had he been our indefatigable and skilful guide and leader in our mining and other engineer operations, but his fulness of resource, his quick intelligence, his excellence at all manly exercises, his geniality and humour had made him the life and adviser of the garrison in every strait, in every sortie, in every measure for the furtherance of the defence. We had already lost Major Anderson, our Chief Engineer, who, though unable, from ill health, to take so active part in the operations, had been invaluable in all the preparations, and as an adviser to Sir Henry Lawrence. Major Banks too, Sir Henry's successor as chief civil authority, had been killed; and Major Francis, whose vigilance and sagacity in command of the Mutchi Bhowm, had kept matters quiet in the city till the actual commencement of the siege. While speaking of those whom we had thus lost, there are two others whom I must mention, since dead, but who survived the siege—one, Sir John Inglis, who, until the siege began, had not been regarded in any other light than as the genial, kindly, gallant Colonel of the 32nd, but who, suddenly raised to the Chief Command, rose to the position, and by his ceaseless vigilance, undaunted bearing, and wise confidence in his staff and subordinates, led the defence on to its successful issue, the credit for which must attach to him, burdened as he was, with all its responsibility—the other, Captain James, our Commissariat Officer. To his indefatigable and untiring efforts we owed that vast collection of supplies which supported, not only our own garrison for three months, but the increased garrison after Outram's arrival for two months more. To his constant guidance and supervision, whilst suffering ceaseless agony from a bullet in his knee, we owed that careful custody and distribution of those supplies, from which it resulted that there was no such thing known as want of daily food to any single member of the garrison or inmate of the entrenchment.

To revert to my narrative: Captain Fulton was killed on the 14th September; and we were then suffering from all the anxieties resulting from ignorance of what was going on in the outer world, and from a feeling of increasing weakness, and the possible desertion of the native garrison, but, in a week more, the glad tidings of the approach of Outram and Havelock was brought in by one of our spies. On the 23rd September and the 24th we heard the cannonading at the Alum Bagh; on the 25th we heard it approach and then go off to the left. Later on in the afternoon, we saw British troops coming towards the river in front of the Kaiser Bagh; then all of a sudden towards sunset, we heard sharp musketry in the streets in that direction; and in a few minutes more, the leaders of the relieving force had clambered into the entrenchments, and the ringing cheers over the whole position announced that all feeling of danger was over—that all the pent up anxiety of the last four months was at an end.

Such is a simple, and I may add unvarnished, narrative of the events of our defence. To give the proper colouring to it—to enable you

to realize its true tone and circumstances,—I must go more into detail.

First, I will deal with the more purely military features.

Our fighting strength, at the beginning of the siege was, as I have already told you, about 1,700 men, all told, including 700 natives and the sick and wounded, of whom the number was large (after Chinbut) from the beginning; and we had about 30 guns and mortars. At the end, our numbers were reduced to one-half, and our gunners were fewer than our guns.

The enemy had at least 16 regiments of infantry, and six of cavalry, besides sowars of the old Nawabee troops and eventually the feudal retainers of the talookdars.

They hemmed us in by an impassable cordon—so impassable that not more than half a dozen of our emissaries, if so many, ever managed to slip through, in spite of rain and darkness, and not more than three written communications ever reached us safely.

Nowhere was their line more than 100 yards distant from us; on the southern point they were separated from us only by a narrow street until we blew up Johannes' House.

The significance of this must be realized; it meant the appalling fact that a couple of minutes of carelessness or relaxation of vigilance might let the enemy into our midst.

On the west and south points our line of defence lay in buildings which screened the enemy's fire from the interior of the position; and on the north face, the lower level of the enemy immediately in front had the same effect. But from the opposite side of the river, and from the buildings to the east, as well as from the direction of the Iron Bridge, all the open spaces about the Residency were completely commanded, and we had generally to move at the double.

During the whole siege, day and night, there was a constant, intermittent, desultory, aimless fire kept up, concentrated on the position, singularly ineffective and harmless in proportion to its amount, but necessarily, in the course of time, the cause of a heavy bill of casualties and of the crumbling away of our buildings and defences. The nature of that fire may be best described by saying that at any place in the position and at any time in the day or night you were certain, in the course of a minute, to hear the ping of a bullet or its thud on a wall.

This desultory firing was a perfectly different matter from their sharpshooting. This was directed almost entirely at our loopholes and at certain roads and passages. A very large proportion of our losses, among them Major Banks, was due to shots through the head while looking through loop-holes. After a time, we never used a loop-hole without first darkening it, by a cap or otherwise, and drawing the fire of whoever might be watching it.

The enemy never constructed and worked batteries of artillery

in our sense of the term. They generally secreted their guns behind houses; there loaded them, ran them round the corner, fired them, and drew them back. They never placed them in position and tried to make a breach. They usually fired at the upper storeys of buildings rather than at the foot of the defences; for attempts to breach these, they really relied entirely on mining.

In every one of their general attacks they had expected to find a breach thus made by a mine, the explosion of which was the signal for assault; but, as the narrative has shewn you, they failed on every occasion except one. In these attacks they occupied the whole of the surrounding positions in force, and concentrated a ceaseless rain of fire on the entrenchments; but, as we kept well under cover, most of our casualties during them were chiefly from the fire from the rear direction.

To turn to the mining operations. Our main difficulty lay in lack of labour, as compared with the unlimited supply available for the enemy. Our process was: first to sink a shaft or well till it reached what we believed to be a depth of about eight feet below the ground outside. This shaft was, of course, in the outermost portion of each part of a building, generally in the verandah which had been enclosed and barricaded. Next a gallery or underground passage was thence driven out horizontally to such a distance, 20 or 25 feet, that its explosion would not damage the building; then another gallery would be dug out at right angles to it, parallel to the front of the building. From this, the listening or protection gallery, we could await the enemy's approach or attack. If their mine broke into ours, we would seize their mine, drive the enemy out of it, and probably lodge powder in it and blow it up. Or we might run out a small gallery in the direction in which we heard them approaching, lodge powder in it, and blew their mine in. Our success lay in careful listening and correct calculation of the distance of the enemy's mines. Eventually they got so nervous from being always heard, defeated, and blown up, that they took to digging with the *khoorpa*, (the grasscutters' knife or trowel,) instead of with the pick and spade. In the Residency mines, the soil was so good and stiff that the galleries did not require any casing or supports.

Nothing can be imagined more exciting than these mining contests sometimes were. Imagine yourself kneeling in one of the protective mines listening to the enemy's pick, or his trowel, coming nearer and nearer—then would come its stroke slightly beating through the skin of earth between him and you—dead silence would follow—a comrade would be summoned by the miner, then whispering consultation, cautious resumption of work would ensue, then the hole would be enlarged. You would either fire through it, or heave down the thin skin of earth that separated you. The lights would be at once put out, the enemy would scuttle off, you following on your knees firing. You would thus seize their mine, then dig a small chamber in its side at the end, lodge your powder, lay your train, tamp back,



leaving a sufficient aperture to fire through—then blow up the charge, and so destroy the mine, and probably shake the house whence it had started.

The only aggressive mine we made was that from which we blew up Johannes' House. Our first gallery by which we got under the middle of the building was 40 feet long; then two other galleries were driven right and left about 20 feet long each; from the ends of each of which two slight passages were driven parallel to the first gallery; and at the points of these four passages 100lbs. of powder were lodged, and after tamping and the usual preparation, which I need not describe, blown up, driving the walls of the building outwards, causing it to collapse entirely, and killing and burying in its mines the whole of the garrison that had filled it.

One post, respecting the mining of which by the enemy there had always been great fears, was the Redan. There never was any doubt, after the first attack, that the enemy were again trying to mine it. But we had carefully calculated the distances, and come to the conclusion that the length which this mine would have to be was quite beyond possibility to them, even if it were straight, whereas both the direction and the shape would be very difficult points for the enemy to hit off correctly. Several of us from time to time crept out and listened for the sound of the pick near the foot of the Redan and never heard it. As it proved, this second mine was half its proper length, and as much too far inclined to the right as the one which they exploded on 20th July had been to the left. I blew it up after the relief, having first surveyed it and driven in a peg over the spot where it ended. I pointed out this peg to an unbelieving friend, as the terminus of his much dreaded mine. His remark was: "You may talk till Doomsday but you will never convince me that that hole (the mouth of the mine) does not get below the Redan." "Wait then for a few minutes till I blow it up," was my rejoinder, but that would have been too convincing, and he was off. Still that was the prevalent belief, especially of the garrison of the Redan; and I cannot imagine any higher type of courage than that of Capt. Sam Lawrence and his comrades who ungrudgingly, almost gaily, held the post, under the full belief that they were certain of being at some moment or other hurled unexpectedly into the air.

I may add that the protective mines we had constructed, and the extent of ground which had been rendered by explosions useless for mining purposes, had by the time of the relief made us almost safe against further mining.

We made sorties occasionally, generally in order to seize and blow up some troublesome building. The necessity which existed to avoid needless explosion and loss of life made these sorties less frequent than they would otherwise have been, for, as a rule, they were very successful, and produced a good effect on the spirits of the garrison. Our arrangements were usually to this effect. We lined the front opposite the house to be attacked, and first by judicious

firing at their loop-holes weakened their defence. Our party being ready, an officer and a couple of selected men, carrying what was necessary, made a dart to the left hand of the entrance of the building. If the door was closed, a nail was driven in, and a small bag of powder suspended; the hose which was attached to it was extended and lighted, and thus the door blown open.

If the door was already open, a hand grenade was lighted and thrown into the entrance passage, when it exploded. In either case, the explosion was the signal for the storming party to rush over and into the building, the garrison of which was generally found paralyzed and confused by the explosion and attack. Having thus secured possession of the houses, we lodged charges of powder and laid trains at convenient points in those which we wished to destroy; and, in retiring from the sortie, blew them up in the reverse order to that in which we had taken them.

Occasionally, on a dark evening, half a dozen men stole out, dashed into some picket or post of the enemy, and then back again after doing all the damage they could.

The short ranges between us and the enemy prevented our artillery being used with full effect, but our mortars were invaluable, and were employed in rather exceptional ways. The smaller mortars were made to throw their shells almost into the next courtyards, distant 300 or 400 feet, or even less, to clear them of gatherings of the enemy. This was ticklish work at first, and until our gunners got accustomed to dealing with the very small charges and short fuzes that had to be used. We had many improvised gunners, and one of them, Mr. Marshall, a Civil Engineer, was most effective from his methodical arrangements for regulating his charges and laying his mortars, which he had carefully mapped and traced out at his post. Also, Lieutenant Bruham of the Artillery, by ingenious use of trucks, worked one or two of our 8-inch mortars horizontally so as to produce the effects of howitzers of the same calibre.

In the defence of outposts, picked shots usually acted as the sharpshooters, the muskets being loaded and handed to them by others. There was a large number of spare muskets at every post, and all muskets were kept ready loaded. We had no rifles, except sporting rifles, and, in fact, and a notable fact it is, our defence was the last occasion on which Old Brown Bess was used. Also buckshot was occasionally used for close quarters. This however occurred but seldom, only during the four great attacks.

I hope I have given you by these remarks a clear idea of the details of the contest which was thus carried on for the three months of July, August, and September. Our losses from the enemy's fire were due partly to their sharpshooting, but to a much greater degree to their desultory ceaseless fire, which searched out every spot of the position, and daily found its victims; there were, I believe, only two nights in which there was not a funeral. Some of their most distant guns played the greatest havoc, as well as playing some ludicrous

pranks ; thus one shot cut away the pillow under Lieutenant Hall's head while sleeping on the Post Office, and another catching the edge of a lady's dress, in the same building knocked her off her feet without hurting her further.

Now realize the circumstances under which this fighting went on, and what they implied. There was the ceaseless strain of anxiety—the constant work of one kind or another—the want of sleep, the exposure to the midsummer sun and the monsoon rains. Most of us were rarely dry. Our clothes were few, and latterly we were almost in rags. We never actually starved ; but our food was scanty and was restricted to a morsel of coarse beef and a handful of rice, and another of flour. Many had to cook their food themselves. For all the members, 22 in number, of the mess to which I belonged, there were but two servants ; and we were thought well off. You must combine this state of fighting, watchfulness, hard and menial work, with hot sun, muggy temperature, constant wet and dirt, want of clothing, poor and coarse food, consequent sickness and scurvy, and absence of news of succour to realize our true position.

And, if it was rough work for the men, what was it for the women and children ? True it is that, though shot and shell did find their way into apparently perfectly safe spots, they were lodged in comparative security, but their anxiety and privations were as great as those of the men, with food so coarse as to be to them almost uneatable, cooped up in rooms from which they were never permitted to stir, having generally to cook their own food, to wash their own clothes, and to attend unaided to their children. What wonder that, though their mortality during the siege itself, 55 children out of 266, 17 women out of 237, was less than might have been expected, few survived whose health and strength, of body or of mind, were not found to be more or less affected.

What we would have done without that faithful body of native troops who remained staunch to us it would be difficult, and not pleasant, to conjecture. Their fidelity was quite exceptional. It was thorough in a way which only we, who had to do with them, can realize. They volunteered to accept situations and perform acts which, under normal circumstances, would have been thought utterly at variance with their religious and caste ideas. They were grandly brave in fighting, and unflagging at their own works and defences, and their casualties were excessive, those, for instance, of the 13th N. I. being actually more than their whole original strength, owing to the number who were wounded twice and oftener.

Still, as I have already mentioned, there were grave doubts arising, when the siege was approaching its end, whether these faithful men were not beginning to think that our case was hopeless, that they had sufficiently fulfilled obligations, and that they must shift for themselves. I have described how scanty was the news we ever got from without. About the 24th July, we heard of Havelock's intention to come to our relief ; and of this, of course, our Sepoys had

duly heard ; then on the 6th and 15th August we heard of his being checked, and after which we heard nothing more till the very end. While our Sepoys were being told every night at their outposts, in shouts from the enemy's posts opposite them, that the English had been swept away all over India, and that all stories of a relieving force were made up lies. No wonder that they believed this to be really the state of the case.

That they did believe so, I know to be a fact, because they told it to me themselves at a night working party ; they said that Ungud, our one really successful spy or messenger, had merely concocted these stories to get the large reward we had offered. And I believe I somewhat affected this disbelief by asking them how Ungud could have brought in a false letter from the brother (or rather cousin) of one of our officers, who recognized the hand writing, and how he could have invented the square buttons and the bag pipes of the Highlanders, which he said he had now seen, but which he had certainly never seen before ; and, here I may say, on the day of the relief, there was no more jubilant figure than that of old Ungud, careering from one outpost to another, snapping his fingers at his sepoy friends, and asking them whether they now believed him or still thought him a liar.

What then was our own state when the relief arrived ? We were tolerably safe from mines ; but our strength, in combatants, was reduced to one-half, and of these very many were sick and wounded, and the rest were all more or less debilitated ; we had come to the end of our animal food ; our entrenchments and the outer walls of our buildings were crumbling away ; the native portion of our garrison was not unlikely to desert us ; and we could not then have held our outer line of defences ; we must have withdrawn into our inner posts. This sign of weakness would have given heart—the one thing they lacked—to the enemy, who would almost certainly have then been able to storm and crush us. Such being the case, I have but to say, as a fitting conclusion to this lecture, that we of the Lucknow Residency owed our lives to that gallant little force that fought their way in on the evening of the 25th September, losing 500 men in its final rush.

His Excellency the Chairman having, at the close of Colonel Innes' lecture, invited remarks, Lieutenant-General the Hon'ble T. F. Wilson, C.B., &c., rose and said :—

"YOUR EXCELLENCY, LADIES AND GENTLEMEN,—Considering the brief period permitted him, our gallant lecturer has, I think, given you some very interesting accounts of the chief incidents which occurred during the defence of Lucknow in 1857. I will not weary you by following Colonel Innes through the details into which he has entered, but will confine myself to making some remarks in general corroboration of what has been said to you, and to making mention of some of those who took part in the defence, or were in the entrenchments, during the protracted struggle."

"The conditions surrounding the defence of Lucknow are some of them so remarkable, that it seems to me desirable that I should say something in confirmation of what has been stated to you. Lest any one here should imagine that my gallant friend has in some degree overstated his case, or drawn a too highly colored picture of what took place, I do not know that I can do better than read to you some extracts from an order issued in the entrenchments at Lucknow by the late Major-General Sir James Outram, after he had seen those entrenchments and fully satisfied himself as to what had taken place in them during the previous 87 days. After that I will read to you what Lord Canning, then Governor-General of India, wrote two months subsequently, after he had received full reports of all that had taken place. This is what Sir James Outram said in his order of the 5th October 1857 :—"

\* \* \* \* \*

"The Major-General believes that the annals of warfare contain no brighter page than that which will record the bravery, fortitude, vigilance, and patient endurance of hardships, privation, and fatigue displayed by the Garrison of Lucknow, and he is very conscious that his unskilled pen must needs fail adequately to convey to the Right Hon'ble the Governor-General in India, and His Excellency the Commander-in-Chief, the profound sense of the merits of that Garrison, which has been forced on his mind by a careful consideration of the almost incredible difficulties with which they have had to contend \* \* \*. The Lucknow Garrison have, in addition to series of fierce assaults, gallantly and successfully repulsed, been for three months exposed to a nearly incessant fire from strong and commanding positions, held by an Enemy of overwhelming force, possessing powerful Artillery, having at their command the whole resources of what was but recently a Kingdom, and animated by an insane and bloodthirsty fanaticism."

\* \* \* \* \*

"And now I will read to you what Lord Canning penned. I am reading from the *Gazette of India* of the 8th December 1857 :—"

"The Governor-General in Council believes that never has a tale been told which will so stir the hearts of Englishmen and Englishwomen as the simple earnest narrative of Brigadier Inglis."

\* \* \* \* \*

"There does not stand recorded in the Annals of War an achievement more truly Heroic than the defence of the Residency at Lucknow."

"That defence has not only called forth all the energy and daring which belong to Englishmen in the hour of active conflict, but it has exhibited, continuously and in the highest degree, that noble and sustained courage which against enormous odds and fearful disadvantages, against hope deferred, and through unceasing toil and wear of body and mind, still holds on day after day and triumphs."

"The heavy Guns of the Assaultants, posted, almost in security, within fifty yards of the Entrenchments,—so near, indeed, that the solicitations, and threats, and taunts which the Rebels addressed to the Native defenders of the Garrison were easily heard by those true-hearted Men; the fire of the Enemy's musketry, so searching that it penetrated the innermost retreat of the Women and Children, and of the Wounded; their desperate attempts, repeatedly made, to force an entry after blowing in the defences; the perpetual mining of the Works; the weary nightwatching for the expected signal of relief; and the steady waste of precious lives until the number of English Gunners was reduced below that of the Guns to be worked,—all these constitute features in a History which the Fellow-countrymen of the Heroes of Lucknow will read with swelling hearts and which will endure for ever as a lesson to those who shall hope, by treachery

numbers, or boldness in their treason, to overcome the indomitable spirit of Englishmen."

\* \* \* \* \*

"Now I have never heard it asserted that Lord Canning was in the habit of indulging in extravagant language, and that is what he, two months after the events, said about the operations carried on at Lucknow by the garrison under the command of the late Sir John Inglis."

"Many of those who sleep under the shadow of that splendid ruin at Lucknow were early friends, associates, and dear comrades of mine, and with others of them I was once very closely and intimately associated; and if I falter for a moment as I think of them, you must bear with me, for I still retain affectionate recollections of them. First and foremost was that great and good man, the Late Sir Henry Lawrence, whose trusted Chief Staff Officer I was during the last few months of his life, and of whom it is not too much to say that, had he not been at Lucknow in 1857, there would have been no lecture here this afternoon on the defence of the place. Neither can I forget our gallant Commander, Brigadier Inglis, who succeeded to the command of the garrison on the second day of the siege, when Lawrence fell, and whose great anxieties and heavy responsibilities perhaps few, or none, know better than myself. Of the glorious conduct of Fulton, Francis, James, Anderson, and some others of whom you have heard; but you have not been told how Colonel Case, of the 32nd Foot, mortally wounded and horribly mutilated by a grape shot, sternly told the Captain of his regiment, who ran to his aid, to return to his duty as he was beyond all human help. Nor of the Chaplain Polehampton, who, in the place termed the hospital, was shot through the body while ministering to a dying soldier, and who recovered from his wound only to die of cholera; or of Captain Mansfield, who also fell a victim to cholera; or of Lieutenant Dashwood, who succumbed to small-pox. Nor of Lieutenant Grant, whose hand was blown off by a hand grenade, and who, after submitting to amputation of the same limb three times over on account of hospital gangrene, perished. There were many others too who died lingering and painful deaths; for you must understand we had no chloroform, no comforts, and the round shot was constantly crashing through the hospital; but all behaved heroically; and when I think of all these men—and I often do think of them—I always find myself furnished with some of the most remarkable examples of resignation, patience, fortitude, perseverance, and bravery."

"But, while I linger over the virtues of the men, I must not forget the merits of those noble women, who were compelled to undergo all the horrors of the siege. Many of them were delicate ladies, accustomed to all ordinary luxuries; yet now they were suddenly reduced to the sad condition of having no servants and being obliged in many cases to cook their scanty food and wash their own clothes and inhabit the stables, serais, and out-houses of the Residency, as no one could reside in the latter building from its being neither more nor

less than a target for the enemy's guns. Yet under all these sad circumstances, with their children perishing and in some cases their husbands slain, they exhibited an amount of patience, resignation, and sympathy for the sorrows and troubles of others which won for them the silent admiration of all, and many constituted themselves the tender and solicitous nurses of the wounded and dying soldiers, and deservedly won a place, and a prominent place, in the despatches of the day."

"One word more. No mention of what took place at Lucknow in 1857 would be complete without mention—yes! and notable mention—of that glorious band of Hindustani sepoy who were faithful among the faithless. I believe the conduct of the native soldiers at Lucknow, who, with the chances, as it seemed to all, of a thousand to one against success, threw in their lot with us, and remained true to their salt, has no parallel in history. We had upwards of 700 sepoy with us in Lucknow, and how they behaved is attested by the fact that more than 200 of them were either killed or wounded, and no praise can be too strong for those gallant and loyal men. But I must not detain you longer; I will only add that I thank you for the kindly patience you have extended to me."

The Chairman, His Excellency the Commander-in-Chief, commenting in conclusion on the lessons furnished by the defence of Lucknow, said:—

"The address which we have just heard, coming as it does immediately after Colonel Medley's lecture on the Siege of Delhi, seems to me to present features, which deserve something more than a passing notice."

"Col. Medley's narrative illustrated the admirable qualities of British troops in attack, while Colonel Innes has presented to us the other side of the shield. His story shows us that our troops when properly handled and led are equally good in defence."

"Indeed the gallant lecturer seems to me to do bare justice to the original garrison of Lucknow when he says that the reinforcement brought by Sir H. Havelock and Sir J. Outram enabled them to hold out till the eventual relief and withdrawal from the city under Sir Colin Campbell."

"My own opinion (and it is one that is shared by many of the garrison) is, that nothing but absolute starvation could have reduced Sir John Inglis' little force. The reinforcement brought by Sir H. Havelock was warmly welcomed, but there is no room for doubting that the original garrison could and would have held out without assistance till Sir Colin Campbell's relief."

"Apart from this, however, the lecture seems to me to teach us a very plain lesson—a lesson which many of us ought to take seriously to heart. It shows us, in the strongest light, the inestimable value of defensible posts, and proves to us, if proof be needed, that well chosen positions, however slenderly entrenched, may be held by small bodies of determined men against almost any number of Asiatics."

“The defence of Arrah is a striking example of what may be done with the slenderest means, and the melancholy story of Cawnpore confirms the rule; for it is almost certain that a remnant of Sir H. Wheeler’s force might have been saved if they had held on to their miserable entrenchment to the last, instead of treating with their foes. No doubt, the condition of the little garrison was very desperate, but all the same the enemy was unable to force the position, though it hardly deserved the name of entrenchment.”

“As I said before, the lecturer’s story teaches us a lesson, which many of us in this room, including the gallant lecturer himself, should take to heart.”

“We all know that the question of places of refuge has been under the consideration of the authorities for many years. There has been much correspondence and much discussion, but I am sorry to say very little has been done to meet a want that is acknowledged by all as one of the pressing necessities of our position in this country.”

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# United Service Institution of India.

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EXTRACTS from the PROCEEDINGS of the Executive Committee of the Council assembled at Simla.

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3rd October, 1883.

8. Question whether a section should be added to the Journal to consist of "Occasional Papers," &c., &c., as is the practice in the Journal of the Royal United Service Institution of London.

*Resolved.*—That the proposal be adopted.

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11th October 1883.

*Contributions to the Journal.*

2. Question whether the manuscripts of original papers sent for publication in the Journals, or in competition for a prize, should be returned to the writer or not.

*Resolved.*—That the papers be not returned except the writer expresses a wish to have them back, and pays the postage. A notice to this effect to be inserted in each number of the Journal.

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3rd October 1883.

*Financial year of United Service Institution of India and subscription of New Members.*

10. Question whether the financial year of the Institution should be held to commence from 1st January instead of from 1st June, as at present.

*Resolved.*—That the present practice be maintained.

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2. Question whether the practice of the Royal United Service Institution of London, in excusing members, who join the Institution within three months of the commencement of the financial year, the payment of subscriptions for the year in which they join, be adopted.

*Resolved.*—That the practice of the English Institution be adopted. The new rule to run as follows :—

When a member joins the Institution on or after the 1st March, having paid his first annual subscription, he will not be charged a second subscription on the following 1st June, but it will become due on 1st June of the second year.

15th November 1883.

*Non-payment of subscriptions.*

4: Question whether members who fail to pay their subscription be struck off the rolls.

*Resolved.*—That if a member does not pay his subscription for the current year ending 31st May, before the 1st January, that a printed notice be sent to him by the Secretary; and that if the subscription be not paid by the 1st June following, the defaulting member's name be struck off the roll from that date.

With reference to the first of the above extracts, the Council of the Institution invite the aid of members in contributing short notes on subjects of interest of a kind suited to the Journal.

Translations from any of the following would doubtless provide information of the nature required :—

*French.*

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|------------------------------------------|-----------------------------------|
| 1. L'AVENIR MILITAIRE.                   | 6. L'ITALIA MILITAIRE.            |
| 2. L'ARMEE FRANCAISE.                    | 7. LE PROGRES MILITAIRE.          |
| 3. BULLETIN DE LA REUNION DES OFFICIERS. | 8. JOURNAL MILITAIRE OFFICIEL.    |
| 4. LA FRANCE MILITAIRE.                  | 9. L'EXPLORATION.                 |
| 5. MONITEUR DE LA FLOTTE.                | 10. REVUE MILITAIRE DEL'ETRANGER. |

*German.*

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|------------------------------------------------------------|--------------------------------------------------------|
| 1. DER VETERAN.                                            | 7. DEUTSCHE HERRES ZEITUNG.                            |
| 2. MILITAR WOCHENBLATT.                                    | 8. MILITARISCHE ZEITSCHRIFT.                           |
| 3. ORGAN DER MILITAR—WISSENSCHAFTLICHEN VEREINE.           | 9. ARMEBLATT (WIEN).                                   |
| 4. VEDETTE.                                                | 10. OESTERREICHISCH UNGARISCHE MILITAR ZEITUNG (WIEN). |
| 5. STREFFLEUR'S OESTERREICHISCHE MILITARISCHE ZEITSCHRIFT. | 11. ZEITSCHRIFT DES GESELLSCHAFT FUR ERDKUNDE.         |
| 6. JAHRBUCHER FUR DIE DEUTSCHE ARMEE UND MARINE.           |                                                        |

*Italian.*

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|-------------------------------|--------------------------------------------|
| 1. RIVISTA EUROPEA.           | 4. GIORNALE DELLE ARMI DI TERRA E DI MARE. |
| 2. RIVISTA MILITARE. [GENIO.] |                                            |
| 3. GIORNALE D' ARTIGLIERIA E  |                                            |

*Spanish.*

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|----------------------------|------------------------------|
| 1. MEMORIAL DE INGENIEROS. | 2. RIVISITA MARITIMA BRAZIL. |
|----------------------------|------------------------------|

By order of the Council,

W. E. GOWAN, MAJOR,  
Secretary, U. S. I. of India.

## I.

**A "NON-DEPARTMENTAL TRANSPORT CORPS"  
FOR INDIA.**

A SCHEME BY CAPTAIN G. F. YOUNG, D.A.Q.M.G.

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[N.B.—In this paper many details of the complete scheme are abridged.]

## SECTION I.—PREFACE.

1. TRANSPORT has so long been looked upon as a departmental matter that it is difficult to divest the mind of preconceived ideas on the subject to the extent necessary in order to realize properly the working of a system which would introduce an entire and radical change into its whole management.

The present scheme advocates the organization of transport as a fourth arm of the service, by the formation of a Transport Corps divided into compact bodies (like batteries of artillery) as being far better adapted to the working of transport than any departmental system.

2. Not only does the multiplication of departments increase correspondence all round, but a large part of their cost is absorbed by office establishments.

Departments delight in spacious offices, in voluminous returns, baboos, and pens, ink and paper generally, all of which are fatal to a good transport.

3. The exigencies of modern warfare tend more and more to show that what modern armies (with their more rapid strategy, and yet at the same time more extensive requirements) now need is a fourth "arm," viz., transport;\* and nowhere is this want likely to be felt more than in India, where large bodies of civilized troops have as a rule to be taken into uncivilized and barren countries, from which neither supplies nor transport are obtainable in any quantity.

Ordnance and Commissariat stores can be thoroughly well supplied to the troops by departments, but I maintain that transport, to the extent of modern requirements, cannot be properly performed by such an agency.

Again and again the best strategy has to be abandoned for the second best because transport fails, yet such failures will continue to occur as long as the transport "arm" is consigned to a department.

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\* See also para. 123.

The reasons for this are various, but the two chief ones undoubtedly are, first, that the greater part of the time of the officers is taken up by office duties connected with finance and supply; and, second, that while the transport itself is ever on the move the supervising element is stationary, consequently the individual fractions never remain long under the same eye, the necessity of which for transport is vital. For instance, Ordnance or Commissariat stores might be sent from Peshawar to Cabul, and thence to Candahar, and would, if properly packed and guarded, reach their destination without material loss, notwithstanding that they were without supervision *en route*, but 100 mules sent under the same conditions would probably be half killed from sore backs, starvation, etc., even if some were not actually sold by the attendants, and simply reported dead.

4. It is with diffidence that I introduce any criticism of the scheme of an officer having so much greater experience as Colonel Low has, but it is unavoidable in explaining the advantages of the scheme proposed.

Colonel Low's transport appears certain to end in practically much the same state of things as was found so ruinously expensive and ineffective in the Cabul campaign: it is in fact an "old friend (!) with a new face." Once again on the outbreak of war large numbers of men and animals will be collected at certain "depôts," and forwarded thence to the front without any organization worthy of the name.

Droves of men and animals will again be handed over to regiments a few hours before they march, transferred from corps to corps, or from transport officer to transport officer, the animals will again be starved and ill-treated to death by hundreds, their equipment be lost, and the establishments themselves be kept in a discontented and inefficient state from their pay being months in arrears, all as before, and all without any possibility of tracing the blame or effecting a remedy; and all this (as before) notwithstanding all officers are working their hardest. The evil is in fact the disorganization inherent in the working of transport on service by a department.

5. Colonel Low attaches a (so-called) "Regimental Transport" to certain regiments, but who can suppose that even this small portion would remain long under the same command, and that if transport was available in one corps and required for another it would not be taken from the one and given to the other; undoubtedly on service it would have to be so taken (para. 33), and in that case the best part of Colonel Low's scheme at once collapses; for not only do such transfers cause endless confusion, but after the animals of a regiment have been once or twice taken from it, all concerned lose their interest in such transport and cease to look upon it as regimental, a name to which it has no claim.

Regimental transport is in fact a myth. Real regimental transport would consist in each regiment having a permanent transport for its full equipment and as untransferable to another corps as its arms or horses; such a transport would no doubt be efficient, but is impossible

to any army in the world on account of its enormous expense. But because this is so, must we then fall back upon a "Transport Department" whence a certain amount of transport shall be supplied to the troops as though it were ammunition or beef?

6. The present scheme proposes, while avoiding on the one hand the evils of a department, and on the other the expense of regimental transport, to obtain all the advantages of the latter by substituting regiments of transport (called "Transport Troops") for regimental transport.

Such transport troops would be practically a fourth "arm" of the service; transport thus organized which was employed with one corps or department would be always ready for use with any other without change of command, confusion, or dislocation of any sort, all which are fatal to the efficiency of transport, and all which are inseparable from the constant transfers which must occur with any other organization.

The officer in command of a transport troop would not be charged with any duties of supply or finance (all such being left to the proper supply departments already existing, *and who understand it much better*, viz., the Ordnance and Commissariat), and being relieved of such duties would have time to perform his own proper work, viz., the constant *personal* supervision over the feeding, clothing, and loading of his animals, and the regular payment of his men, and under these conditions (which are no more possible with Colonel Low's transport than formerly) I will venture to say that not one-twentieth of the number of animals will be lost on service which there will if such animals are in the hands of a department, however hard-working its officers.

Transport troops would take as their pattern our frontier mountain batteries, and there is no reason why, after a year or so, a mule troop should turn out for a field day in any way inferior in general efficiency to one of those batteries.

It has often been urged by officers of the Commissariat Department that if the transport is entirely taken from their control they will no longer be able to ensure supply to the troops; a species of scramble also has at times taken place between the different departments for the transport.

With a transport organized under the present scheme the above objection could not be urged, nor could transport, which was urgently required for Commissariat supplies, be taken up unnecessarily by the Ordnance, or that urgently required by the latter be allowed to be idle with regiments, or *vice versa*: the officer in supreme command, who alone is chiefly interested in seeing his force properly supplied with all it requires, having with this system as entire and undivided a command over his transport troops as over the regiments of his force, may be relied upon to employ them for whatever he most urgently requires at the moment, whether it be Commissariat supplies, Ordnance supplies, medical supplies, or for regimental baggage.

7. Transport for baggage and tents of transport establishments is entirely omitted by Colonel Low ; yet this is important and with pack transport is a large item ; so that if, for instance, half the Peshawar Force, (requiring, according to Colonel Low, 3,026 maunds) had to move out, it could not do so *complete*, unless a balance was also provided for this purpose.

This balance has been provided in every case in the present scheme, and is of course available with the rest whenever the transport is halted, *e.g.*, in peace in cantonments ; in war, on stages of a line of communications.

It has also been considered essential in the present scheme to provide 10 per cent. of spare animals, and this with every fraction of transport (except elephant), instead of the small number given by Colonel Low.

These two items, together equal to an addition of  $\frac{1}{8}$ th, cause the total number of animals (especially mules) provided in the present scheme, and its total carrying capacity ("B scale" in the Tables) to considerably exceed those provided by Colonel Low.

8. Even allowing the abovementioned extra transport, and also for Sapper companies entirely mule transport, mules for entrenching tools, water and first reserve ammunition of all infantry regiments, and mules for  $\frac{1}{8}$ th of the requirements in the Punjab Frontier Force, the annual cost (Rs. 26,97,418) is less by one-and-a-half lakhs than that of Colonel Low's scheme, and were these extra establishments reduced would be less by four lakhs. (See also note (a) Table G).

## SECTION II.—DATA ON WHICH THE SCHEME IS BASED.

The data on which this scheme is based are as follows :—

9. That the cost shall not exceed Rs. 35,00,000.
10. That three separate scales of equipment are authorized, *viz* :—
  - (1). "Cold weather service scale," being the "Cabul scale," of the late war.
  - (2). "Half scale," being No. 1 scale for half the troops referred to (*i.e.*, half of No. 1).
  - (3). "Hot weather service scale," being No. 1 scale with the addition of European privates' tents for the European portion of the force.
11. That transport on the half scale shall be kept up in time of peace for the following forces :—

|                                                 |                                    |
|-------------------------------------------------|------------------------------------|
| I.—A movable column and certain outposts in the | } Forces<br>guarding<br>Frontiers. |
| Quetta command ... ..                           |                                    |
| II.—The Force on the Eastern Frontier           |                                    |
| III.—The Force in Burma                         |                                    |
| IV.—The Punjab Frontier Force                   |                                    |

V.—The Force in Peshawar District.

VI.—Three brigades of all arms in the Punjab.

VII.—A brigade of all arms in Sind.

VIII.—A small force in Rohilcund.

The details of each force is given in Column 1 of Table A.

The total strength of these Forces is :—

|     |                                |     |                        |
|-----|--------------------------------|-----|------------------------|
| 9½  | Regiments British Infantry ... | ... | } 46,130 fighting men. |
| 36  | Native Infantry ...            | ... |                        |
| 11½ | Native Cavalry ...             | ... |                        |
| 15½ | Batteries of Artillery ...     | ... |                        |
| 6   | Companies Sappers ...          | ... |                        |

12. That sufficient transport shall be maintained in time of peace, in the four provincial or army corps areas, to equip at any moment forces of at least the following strengths :—

|                                                            |     |     |     |             |
|------------------------------------------------------------|-----|-----|-----|-------------|
| In Punjab 10,000 men, (requiring on the hot weather scale) | ... | ... | ... | 12,056 mds. |
| In Bengal 10,000 men                                       | do. | do. | do. | 12,056 „    |
| In Bombay 8,000 men                                        | do. | do. | do. | 9,600 „     |
| In Madras 5,000 men                                        | do. | do. | do. | 6,000 „     |

Also that in reckoning the transport available for this purpose no portion of that allotted to the four forces guarding frontiers (Nos. I to IV, para. 11) is to be included, on the ground that it might be necessary to mobilize a force in these areas, and at the same time to retain the frontier forces fully equipped.

The transport of the forces Nos. V to VIII may, however, be so included.

13. That the mobile portion (*i.e.*, that which can be moved by rail) of the transport provided under para. 12 shall be sufficient to equip on the hot weather scale a force of not less than 13,500 men concentrated at the sea-board or other distant point.

14. That such arrangements shall be made as will obtain readily and effectively from the various districts on the outbreak of war sufficient transport (supplementary to that under paras. 12 and 13) to keep the forces therein mentioned supplied in the field at the rate of three maunds per man, exclusive of that previously allotted for their equipment.

15. That with the exception of the Punjab Frontier Force transport all camels shall be hired.

16. That Government transport carts shall be of two sizes :—

- (1) The Army Transport Cart, drawn by two bullocks or mules, and carrying 12 maunds.
- (2) The Light Cart, drawn by one mule, and carrying six maunds.

17. That in the case of the Bengal Presidency Army Transport Carts shall in time of peace be drawn by siege train bullocks.



18. That the scheme shall include arrangements for the instruction of officers, non-commissioned officers and men.

### SECTION III.—SCOPE OF THE SCHEME.

The scheme provides as follows :—

19. It gives half transport on the service scale to the troops guarding the different frontiers and to certain other forces ordered to be so equipped as detailed in para. 11; collectively 46,000 fighting men (Section V).

20. It gives transport for a mobilization, in the four provincial areas, of forces of the following strengths equipped on the "hot weather" scale :—

|                    |  |                   |
|--------------------|--|-------------------|
| Punjab, 11,500 men | \| | Bombay, 9,000 men |
| Bengal, 11,800 men | \| | Madras, 7,000 men |

while leaving all forces guarding frontiers fully equipped (Section VI).

21. It gives transport of a kind able to be moved by rail sufficient for the mobilization at the sea-board or other distant point of a force of 14,000 men equipped on the "hot weather" scale, while leaving the transport of the whole of the equipped forces complete (Section VI).

22. It provides an organized system, by the augmentation of regular peace cadres to their war strength, for the supply, on the outbreak of war, of transport, to supplement that noted in paras. 19, 21, sufficient for the following amounts of supplies :—

|                     |  |                     |
|---------------------|--|---------------------|
| Punjab, 30,800 mds. | \| | Bombay, 24,200 mds. |
| Bengal, 30,200 " | \| | Madras, 16,800 "    |

and at the sea-board or other distant point, of "mobile" transport equal to 76,000 maunds for a similar purpose, or sufficient for one month's supplies to a force of 25,000 men. The peace cadres are grouped in circles throughout the country during peace.

(b) For a mobilization, such as on the Afghan frontier, the scheme provides transport by the augmentation of peace cadres to equip a force of 35,000 men complete with one month's supplies; or to equip and supply a force of 50,000 men, half the force being at a distance of 15 marches from the base, and remainder on the communications (Section IX).

23. In all the above cases (paras. 19—22) it provides also with each fraction of transport, additional transport (not calculated in the above) for the baggage and tents of the transport establishments themselves, and also ten per cent. of spare animals.

24. It also provides for a course of instruction in all transport duties to a certain number of officers to form a reserve, and for the training of all officers and men in loading of transport animals.

Also for pensions to the inferior establishments at a yearly cost of Rs. 18,000.

The total cost is Rs. 26,97,418 ; or, if the alteration noted at foot of Table B is made, Rs. 26,50,587.

If the carrying capacity were reduced to the limits of Colonel Low's scheme, the cost would be reduced to Rs. 24,38,000.

#### SECTION IV.—OUTLINE AND GENERAL PRINCIPLES.

25. In the present scheme the transport is "non-departmental," that is to say it is organized not as a department but in a certain number of compact bodies, called transport troops, each complete in itself and placed under the General Officer commanding as a fourth "arm" of the service for the conveyance of the other arms and their supplies from place to place.

26. Roughly speaking each troop is formed to carry 1,000 maunds, in addition to the baggage and tents of its own establishments, is commanded by a British officer, and is divided into five subdivisions (under native officers), each again divided into four sections (under duffadars).

27. In peace 18 troops are disembodied entirely, i.e., exist on paper only ; but the majority of those not maintained always on a war footing have four of their subdivisions disembodied, while the fifth is maintained as a cadre augmentable in war to five times its strength by the re-embodying of its other four subdivisions.

28. The transport required by India may be divided thus :—

(1). That required for the equipped forces mentioned in para. 11.  
(2). That required to be kept ready for the mobilization of the forces mentioned in para. 12, including sufficient mobile transport to equip a force at a distant point as per para. 13.

(3). That not required to be maintained in time of peace, but required to be readily available for war in order to supplement No. 2, and to keep the mobilized forces supplied at the rate of three maunds per man, as per para. 14.

29. No. 1 one of the above is provided by 29 transport troops on their war footing (Tables A and C and Section V).

No. 2 is provided by the cadres of 52 other troops which are on a peace footing, in addition to such portion of the above 26 complete troops as may be reckoned available under para. 12 (Tables B and C and Section VI).

Although, when necessary, these cadres can collectively supply what is required by each case (as shown in Section VI), it would probably generally be preferable, for instance, to augment one cadre to its war strength of a troop of five subdivisions, rather than to group five cadre subdivisions together for the occasion, as would otherwise be done.

No. 3 is provided first by the disembodied subdivisions of the above 52 cadres, and second by 18 entirely disembodied troops (Section IX).

Necessity that a few troops should be entirely disembodied.

30. The necessity for having some troops entirely disembodied lies in the fact that a multiplication by five of the peace requirements is not enough for the war requirements.

(N.B.—Colonel Low's war establishment is, in mules and pack bullocks, only four times, and in other cases only five times, that of his peace establishment).

Total number of troops required.

31. The total number of Transport Troops for India is :—

|                                                            |    |
|------------------------------------------------------------|----|
| On a war footing, as per Tables A and C ...                | 26 |
| On a peace footing (cadres only) as per Tables B and C ... | 52 |
| Disembodied, as per Table L and para. 111 ...              | 18 |

Total ... 96

32. The minor organization of these transport troops is so arranged that a close approximation to the amount of transport required can always be obtained without breaking the subordinate commands, viz., subdivisions, sections and (where necessary) "units." (Table F and I to XVI).

Object sought in the organization.

33. In the field it will (with any scheme) constantly be necessary to vary the distribution of the transport work; this is practically not possible with Colonel Low's regimental transport.

For instance, it would often be necessary to take the mules of the cavalry and send them with the infantry, who might be going along a route impracticable except for mules; or to take the half transport of several regiments and send them with one, or with departmental stores; or for a corps below strength to lend animals to one above strength; or for a large part of the transport on the communications to be sent forward to replace losses at the front, and so on. The inconvenience and confusion entailed with Colonel Low's regimental transport in making such transfers (which would almost certainly take place on the eve of a march) would be indescribable; whereas with a transport troop no such transfer is necessary since the subdivision or section may to-day carry cavalry baggage, to-morrow Commissariat stores, and the third day infantry baggage, all without change of command or dislocation.

Necessity of being able to vary distribution of transport work.

34. To suit the various circumstances and requirements, troops are formed of every description of transport and also of varying strengths, viz :—

(1.) Mule troops (full), i.e., with five subdivisions carrying 1,000 mds.

- (2.) Mule troops (reduced), *i.e.*, with four subdivisions carrying 800 mds.
- (3.) Camel troop (full), *i.e.*, with five subdivisions carrying 1,000 mds.
- (4.) Camel troop (reduced), *i.e.*, with four subdivisions carrying 800 mds.
- (5.) Mixed troop (full) ...  $\left\{ \begin{array}{l} 1 \text{ subdivision mules} \\ 4 \text{ " camels} \end{array} \right\} 1,000 \text{ mds.}$
- (6.) " " (reduced)  $\left\{ \begin{array}{l} 1 \text{ subdivision mules} \\ 3 \text{ " camels} \end{array} \right\} 800 \text{ "}$
- (7.) Four mixed troops of various strengths for the Punjab Frontier Force.
- (8.) Three elephant troops of various strengths for Assam, Burma, and Oude.
- (9.) The Assam Coolie Corps.

Of the following only the cadre subdivisions are maintained in peace:—

- (10.) Army Transport Cart Troops. The cadre carries 600 mds.; the full troop, 3,000 mds.
- (11.) Pack Bullock Troops. The cadre carries 400 mds.; the full troop, 2,000 mds.
- (12.) Light Cart Troops. The cadre carries 200 mds.; the full troop, 1,000 mds.
- (13.) With the exception of the three elephant troops above-mentioned, elephants are formed in independent sections of six elephants each, the section carrying 90 mds.
- (14.) Cart troops of country carts (when formed) consist of 150 each, such carts taken at an average carrying power of 20 mds.

The subdivision therefore will carry 600 mds., and the full troop 3,000 mds., as in the case of Army Transport Cart.

#### TROOPS—TABLES F. AND I. TO XVI.

*"Mixed" Troops and "Reduced" Troops are solely formed to meet the special requirements of peace.*

35. The cadres are grouped for convenience into circles. In each circle there is one officer who, while belonging to one particular cadre (in nearly every case the A. T. Cart Cadre), has command of the rest as long as they are on a peace footing. The circles are not in any sense depôts, as they do not form a source of supply to equipped troops.

36. The Officer Commanding the Circle Cadres would have no command over such fully equipped troops as might be stationed in the same circle.

At the same time all detached fractions of transport would be under any officer of transport on the spot.

B

37. In war each troop is commanded by a Lieutenant or Captain ; Lieutenants as a rule having the (smaller) commands of Pack Transport Troops, and Captains those of wheeled transport ; in peace an officer to each is not necessary, therefore some have the command of a second troop attached.

Captains of A. T. Cart Troops remain in peace in command of their cadres, having attached thereto the other cadres in the circle. There is one such officer in each circle. (Table D).

38. Besides the Officers Commanding Troops and Circles, a Staff Officer for transport is attached to Army Head Quarters ; he would inspect once a year the equipped troops, and as far as possible the cadres, and would also arrange the general working of the Government transport in the annual relief.

This officer should be an Assistant Quarter-Master General for Transport, similarly to the Assistant Adjutant General for Musketry.

In war a similar officer would be attached to the Force.

Transport to be under G. O.'s and regularly inspected by them.

Transport to be kept supplied with equipment, food, etc., by the Supply Departments.

39. All transport troops and cadres to be under the entire command of the General Officer Commanding, who would make an annual inspection of each, reporting result for the information of His Excellency the Commander-in-Chief.

40. All supplies, whether of animals, clothing, equipment or grain, to be obtained by indent on the proper Supply Departments.

Officers.

41. The officers required during peace are :—

|                                                |     |                   |  |
|------------------------------------------------|-----|-------------------|--|
| 1 Staff Officer (Major) at Army Head-Quarters. |     |                   |  |
| 6 Captains in Punjab and Bengal                | ... | } 12 Captains.    |  |
| 3    "    in Bombay                            | ... |                   |  |
| 3    "    in Madras                            | ... |                   |  |
| 13 Lieutenants in Punjab, Bengal and Assam     | ... | } 18 Lieutenants. |  |
| 8    "    in Bombay (Sinde)                    | ... |                   |  |
| 2    "    in Madras (Burma)                    | ... |                   |  |

Reserve of officers.

42. Officers to be recruited half from the Staff Corps and half from those of British Regiments, who have passed a good colloquial test.

43. There is no necessity with this scheme for the wholesale instruction of all ranks in transport duties any more than in artillery duties ; at the same time all must be thoroughly taught loading drill.

At present, with a few bright exceptions, regiments look on this as a matter with which they have little concern, whereas badly loaded equipment should be as disgraceful to a disciplined army as dirty belts or rusty arms.

44. Instruction to be a regular duty of all officers of transport ; those commanding camel troops or mixed troops especially will have plenty of time for it, as their animals will be often at graze.

45. Instruction to be (1), that in loading for all ranks, and (2), general instruction in all transport matters to a few selected officers to form a reserve.

As regards (1) a small handbook should be drawn up and issued to regiments ; small parties should attend daily at the lines of the troop or cadre, and be there put through loading drill under the Regimental Commander supervised by the Officer of Transport.

As regards (2) small classes of selected officers might be assembled annually at Head-Quarters of each circle, and be put through a course by the Captain commanding the Circle Transport ; after which they would be examined by a Special Committee and their names registered for employment.

46. By the division of troops into subdivisions (each carrying 200 mds.), and sections (each carrying 50 mds.) a sufficiently close approximation to the amount of transport required can always be obtained ; if necessary "units" (6 mules or 3 camels) can also be detached. Column 9 of Table A gives examples of distributions.

47. Ordinary cases of sickness should be treated by salutaries. A veterinary surgeon should be in charge of all Government animals in each circle. On a troop being moved, all seriously sick animals should be replaced by the Commissariat Department, and either shot or sold.

48. The weights estimated on the half-scale for each corps are given in Table H. Those of infantry regiments are taken at a fair average of what they would be on service, not at their full paper strength. In the present scheme, however, it matters little whether this estimate is correct or not, provided the total transport for the force is not also too low, and this will not be found to be the case (Table A, Column 7).

49. Light carts have been very sparingly allotted for the chief reason that where camels will thrive at all they are cheaper, and that there are many places where camels could be taken where light carts cannot go. Their proper place would seem to be in *second* line, not with the equipped forces. (See also footnote to Table B). Had the camels in Afghanistan been able to be looked after as they would be in these troops there was no reason why they should have died in such numbers.

50. Three things should go with infantry companies everywhere, viz., water, entrenching tools, and ammunition. These should be carried by *bonâ-fide* regimental mules.

In the present scheme a Company equipment of mules is allotted to each company equipped, viz., two for pukhals, two for entrenching tools, and two for ammunition, and in this case, one driver is given to every two mules, so that there is one driver with the water, one with the tools, and one with the ammunition of each company; each regiment equipped on the half-scale has therefore 24 of these mules.

The six mules of each company would be under the Captain of it, who would be allowed to strike one private off duty to look after them.

These mules are not intended to belong to the Transport Corps, but to be "*bonâ-fide*" regimental mules, to remain always with their regiment, and be handed over to the relieving regiment, when the former leaves that part of India. They are, however, shown in the scheme in order to show the cost, etc., properly.

51. In this scheme Sapper Companies have been given entirely

Mules for Sapper Companies. mule transport, as it appears as necessary to them as to cavalry.

Each company is given 12 regimental mules (for water, ammunition, and tools), the rest of their equipment on the half-scale being carried by one section of a mule subdivision.

General principles of allotment.

52. The general principles on which transport has been allotted in this scheme are as follows:—

#### I.—To Equipped Forces—

(a) Infantry regiments are given regimental mules for entrenching tools, 1st reserve ammunition and water at 6 per company.

(b) Sapper companies are given regimental mules at 12 per company.

In addition to the above—

(c) Mules are allotted for all cavalry.

(d) Mules are allotted for all mountain artillery.

(e) Mules are allotted for all Sapper companies.

(f) Mules are allotted for the whole of the Quetta Force.

(g) Mules are allotted for all regiments in Hazara, and in certain proportions for those in Burma, Assam, and the Punjab Frontier Force.

(h) Camels are allotted for all field batteries.

(i) Camels are allotted for all infantry regiments other than as above.

(k) Elephants are allotted in accordance with the special orders of H. E. the C-in-C., and Government, in the proportions laid down, for the Burma and Assam Forces (formed into the Burmese and Assam Elephant Troops).

(l) Coolies are allotted for a proportion of the requirements in Assam (formed into the Assam Coolie Corps).

*II.—To the Transport Circles—*

- (m) Except in Assam and Rangoon a proportion of A. T. Carts (52) has been allotted to every circle; in some, chiefly those in which an arsenal is situated, double the amount has been allotted.
- (n) Light carts have been allotted to Rangoon. (See also footnote, Table B).
- (o) A large proportion of elephants has been allotted to Lower Bengal and Oudh (the latter formed into the Oudh Elephant Troop).
- (p) A small proportion of pack bullocks are allotted to the Rangoon, Madras and Allahabad Circles.
- (q) Mules and camels have been allotted among the circles in accordance with their fitness for the locality and with local requirements—mules chiefly to Upper India and Bombay; camels to Upper India, Sind, and the Deccan.

The apportioning of the transport to be drawn from the several districts on an augmentation has been framed on the same principles (Section IX).

53. The senior officer of transport with a force in the field will be "ex-officio" baggage master to it, and will be in a far better position to exercise authority as such than the baggage masters hitherto seen.

With a transport formed into compact bodies, to a small extent drilled, and at all events thoroughly accustomed to obey certain fixed commanders, we should no longer see at a narrow place in the road, the familiar (and unsoldierly) struggling mass of animals and men, those of each regiment fighting to get its baggage on first, while no single individual has the smallest control over the disorderly and (to an army) disgraceful scene.

54. No special buildings at centres of circles are likely to be required; the transport in each circle will be distributed among the different stations of the circle.

55. In the tables two scales of "maundage" are given, called "A" and "B," the former showing the amount always available, the latter that available when the troop or cadre is halted (admitting of that of the transport establishments being also used). (Para. 7).—Transport has been in all cases allotted on the "A scale" to the full extent required, that of the transport establishments (included in the "B scale") remaining as so much extra available on certain occasions.

56. Carriage required for peace movements over and above what the Government Transport Corps can supply should be provided by civil officers on indent of officers commanding regiments, payment for that used for public purposes being recovered by contingent bills from the Commissariat Department.



57. *Depôts* will be necessary in time of war; they should be a part of the Commissariat *Depôts*, their duties being simply the purchase and collection of animals, etc., and their issue to the transport troops of the force; in the field, each *depôt* should have a small veterinary hospital attached for the receipt of animals, which have to be replaced in the troop, yet will be afterwards available for re-issue.

In peace, as animals to replace deficiencies can be readily obtained, the Commissariat will only have to maintain at each Head-Quarter Station a very small number, if any.

58. All transport animals in war should be Government property, as owners cannot then make satisfactory arrangements for feeding them, and it is cheaper in the end to Government than hiring and paying large sums for compensation. Camels previously employed on hire would be taken over at a valuation.

59. Every opportunity should be taken during peace of having the transport troops and cadre subdivisions out on field days.

60. *Table A* shows the transport required by, and the transport troops allotted to, each of the equipped forces (para. 11).

*Table B* shows the transport allotted (in cadre subdivisions) to the various circles to meet the requirements other than those of the equipped forces.

*Table C* shows the abstract of *A* and *B*, viz., the total troops and cadres to be maintained.

*Tables D, E, F, G, H, and K* contain various details, including total cost.

*Table L* shows the disembodied transport to be drawn from Bengal, Madras, and Bombay, to augment from peace to war footing; that for the Punjab is shown in para. 111.

*Tables I to XVI* show the details of establishments in each troop or cadre; (the tables containing the cost of each in detail have been excluded from this paper).

*N.B.*—In all the tables, if wishing to compare with Colonel Low's, the amount shown as the "B scale" must of course be taken, as that alone shows the *total* provided.

#### SECTION V.—ALLOTMENTS TO EQUIPPED FORCES.

61. The forces to be equipped with half transport are those detailed in para. 11. Referring to *Table A* (with which, and *Tables I to XI*, this section should be read)—

Col. 1 shows the detail of the force.

Col. 2 gives the number of regimental mules (paras. 50 and 51).

Cols. 3 and 4 give the balance of maundage required as per *Table H*.

Col. 5 shows the transport troops allotted.

Cols. 6 and 7 show the maundage they can supply on both "A" and "B" scales, the total in all cases exceeding that required.

Col. 8 shows the number of animals provided.

Col. 9 shows the probable convenient distribution. This does not imply any making over of transport to regiments (except as per paras. 50 and 51), which is opposed to this scheme, but merely the way it would be distributed supposing each corps required the exact amount laid down for it. The transport allotted to a force would always be employed under its own commanders, and because a troop or subdivision is attached to a regiment or company to carry its baggage, it is no more to be supposed to be made over to it than one of H. M.'s troopships is made over to the troops it carries.

In the tables 1 S. D.=1 subdivision, and  $\frac{1}{4}$  S. D.=1 section, except in the Coolie Corps, where  $\frac{1}{2}$  S. D.=1 section.

62. *Peshawar Force*.—For each of the Sapper companies will be required 1 mule section, and for each of the native cavalry regiments 3 mule sections—total for 2 Cavalry and 2 Sappers, 8 mule sections (or 2 mule subdivisions); 11 camel subdivisions will do for the rest of the force, which is therefore given 1 camel troop (full) (=5 subdivisions) and 2 mixed troops (reduced) (=6 camel subdivisions and 2 mule subdivisions)—(See Form F), making the required total of 11 camel subdivisions and 2 mule subdivisions.

The total animals allotted, including regimental mules, are 384 mules and 512 camels, and the total maundage 3,328 mds.

Three officers not being required during peace for these three troops the camel troop is attached to one of the others (Table D).

63. *The three Punjab Brigades*.—Each brigade is given one full and one reduced troop.

In the 1st and 3rd Brigades a complete mule subdivision is provided to meet the requirements of each mountain battery.

The 2nd Brigade having no mountain battery has a camel troop for its second troop.

The total animals allotted to these three brigades are 924 mules and 1,024 camels, and total maundage 6,963 maunds; one officer will be sufficient in peace for the two troops of each brigade (Table D).

64. *Scinde Force*.—One mixed troop (reduced) provides for the native cavalry and infantry, and one camel troop (reduced) for the British infantry and artillery.

The total animals allotted are 192 mules and 326 camels, and total maundage 2,014 mds.

65. *Rohilcund Force*.—The requirements of the infantry are met by camel troop (reduced). The two guns and the squadron are, as a special case, given regimental mules; 96 mules and 186 camels are allotted, and a total maundage of 1,122 mds.

66. The transport named in paras. 62—65 is available for a mobilization under para. 12.

67. *The Quetta Force.*—This force differs in having a moveable column on the full cold weather scale and five days food; also certain outposts whose requirements are shown in Col. 9.

To meet this three mule troops (reduced) are allotted, two at Quetta and one at the outposts.

The infantry being on the full scale require double the number of regimental mules, or 48 per regiment.

A total of 1,599 mules is provided, the total maundage being 3,198 mds.

Ordinarily two officers will be sufficient, one for the two troops at Quetta, and the other with that at the outposts; the officer to command the third troop on emergency would be nominated from the Quetta Garrison and ready to take command whenever required.

68. *The Eastern Frontier Force.*—The circumstances of this force are special:—

The troops at Kohima require coolies only.

Those at Debrooghur require elephants only.

Those at Shillong require elephants and mules.

Those at Cachar require elephants, mules and coolies.

In this case the requirements of, and allotments for, the Assam Circle have been included with those of the force, as it is more convenient and they are practically the same.

The allotment for the whole, both force and circle together, is:—

The Assam Elephant Troop, the Assam Coolie Corps, one Mule Troop (reduced) and 6 Boats.

The Elephant Troop has 7 subdivisions each of 12 elephants; the Coolie Corps has 18 subdivisions each of 68 coolies.

The distribution shown in Col. 9 is in accordance with the scale laid down by His Excellency the Commander-in-Chief. The balance, viz., 4 subdivisions of the Coolie Corps, 3 subdivisions of the Elephant Troop, and 2 subdivisions of the Mule Troop are for employment in the circle generally.

A separate statement shows the exact number of animals, etc., at each station.

A total of 557 mules, 85 elephants, and 1,224 coolies and 6 boats are allotted to the force and circle together, with a maundage of 3,331 mds.

As in para. 62, two officers will be sufficient in time of peace, one to command the Elephant Troop, with the Coolie Corps attached, the other the Mule Troop and the boats.

69. *Burmese Force.*—The circumstances of this force also are special, the Government order on the subject of elephants for it being as follows:—

|                                      |                   |
|--------------------------------------|-------------------|
| For each of 2 Mountain Batteries ... | ... 18 elephants. |
| „ 2 Bengal Infantry Regiments ...    | 15 „              |
| „ 5 Native Infantry Regiments ...    | 8 „               |

The Burmese Elephant Troop is therefore formed of 9 subdivisions of irregular strength, viz :—

|                   |     |     |     |               |
|-------------------|-----|-----|-----|---------------|
| 2 subdivisions of | ... | ... | ... | 18 elephants. |
| 2                 | "   | ... | ... | 15 "          |
| 5                 | "   | ... | ... | 8 "           |

and the transport allotted to the force is the Burmese Elephant Troop, and two Mule Troops (reduced), or a total of 107 elephants and 1,174 mules, with a maundage of 3,953 mds.

The Sapper Company has regimental mules for its whole requirements.

One officer in peace commands the two mule troops, and another the elephant troop with the small amount of transport belonging to the Rangoon Circle. (Table D).

70. *Punjab Frontier Force*.—Four troops are formed, one for each of the following groups, one officer to each :—

|                    |     |                               |
|--------------------|-----|-------------------------------|
| Hazara             | ... | } One troop (6 subdivisions). |
| Hoti-Muridan       | ... |                               |
| Kohat              | ... | } One troop (6 subdivisions). |
| Bunnoo             | ... |                               |
| Dera Ismail Khan.. | ... | } One troop (8 subdivisions). |
| Dera Ghazi Khan..  | ... |                               |
| Rajanpore          | ... | } One troop (3 subdivisions). |
|                    |     |                               |

If necessary the Dera Ismail troop could easily be split into two troops.

There is allotted—

|                                                        |     |                                            |                               |
|--------------------------------------------------------|-----|--------------------------------------------|-------------------------------|
| For each Mountain Battery                              | ... | 2 mule sections=60 mules.                  |                               |
| For each Native Infantry Regiment                      | {   | 1 mule subdivision.                        | } 204 mules.                  |
| in Hazara ...                                          |     | 2 mule sections and 24 regimental mules.   |                               |
| Do. do. elsewhere ...                                  | {   | 1 camel subdivision.                       | } = { 46 camels and 84 mules. |
|                                                        |     | 2 mule sections and 24 regimental mules.   |                               |
| For each Native Cavalry at Murdan and Dera Ismail Khan | ... | 1 mule subdivision=120 mules.              |                               |
| For each Native Cavalry at Dera Ghazi and Rajanpore    | ... | 3 mule sections=90 mules.                  |                               |
| For each Native Cavalry at Kohat                       | ... | { 24 regimental mules and 2 mule sections. | } = 84 mules.                 |

making a total of 1,988 mules and 414 Government camels with a total carrying capacity of 6,046 maunds. There are 400 more mules than in Colonel Low's allotment to this force.

71. The transport noted in paras. 67—70 is not available for a mobilization under para. 12.

#### SECTION VI.—ALLOTMENTS TO CIRCLES, AND TRANSPORT AVAILABLE FOR A MOBILIZATION.

72. The allotments to the various circles are contained in Table B, the Captain of the A. T. Cart Cadre in each circle commanding the whole.

73. The total transport for the four provinces and throughout India is shown in Table E.

74. The circles provide transport for a mobilization in their area, or at the seaboard (para. 29) and for local peace requirements.

75. For a mobilization of 10,000 men in the Punjab, requiring a maundage of 12,056 maunds, (exclusive of that for transport establishments and spare animals), there is available as follows :—

| DETAIL.                                                                        | MAUNDAGE AVAILABLE |                  |
|--------------------------------------------------------------------------------|--------------------|------------------|
|                                                                                | On<br>"A Scale."   | On<br>"B Scale." |
| 3 Transport Troops with Peshawur Force and regimental mules (Table A) ... ..   | 2,880              | 3,328            |
| 6 Transport Troops with 3 Punjab Brigade and regimental mules (Table A) ... .. | 6,048              | 6,968            |
| 1 Transport Troop with Rohilcund Force and regimental mules (Table A) ... ..   | 992                | 1,122            |
| From Rawulpindee Circle (Table B) ... ..                                       | 2,450              | 2,724            |
| From Lahore Circle (Table B) ... ..                                            | 1,650              | 1,686            |
| TOTAL ... ..                                                                   | 14,020             | 15,828           |

or sufficient for a force of 11,500 men, and their transport establishments with ten per cent. of spare animals.

In the above the whole of the four troops attached to the Peshawur and Rohilcund Forces have been included, as in the present scheme the transport is independent of the particular force to which attached, and there is, therefore, no reason to leave behind any portion, whether the whole of the regiments with those forces are employed or not.

Should, however, only half of these four troops be included, there is still sufficient for the requirements.

76. For a mobilization of 10,000 men in Bengal, requiring 12,056 maunds, (exclusive of that for transport establishments and spare animals), there is available :—

| DETAIL.                                              | MAUNDAGE AVAILABLE, |                  |
|------------------------------------------------------|---------------------|------------------|
|                                                      | On<br>"A Scale."    | On<br>"B Scale." |
| 1 Transport Troop, etc., Rohilcund ... ..            | 992                 | 1,122            |
| 4 Transport Troops, etc., of 2 Punjab Brigade ... .. | 4,032               | 4,642            |
| Meerut Circle (Table B) ... ..                       | 2,160               | 2,404            |
| Seepree Circle " ... ..                              | 1,650               | 1,686            |
| Lucknow Circle " ... ..                              | 2,040               | 2,079            |
| Allahabad Circle " ... ..                            | 2,050               | 2,118            |
| Calcutta Circle " ... ..                             | 1,410               | 1,434            |
| TOTAL ... ..                                         | 14,334              | 15,485           |

or sufficient for 11,800 men with their transport establishments and 10 per cent. spare animals.

Mobilization in Bombay. 77. For a mobilization of 8,000 men in Bombay, requiring 9,600 maunds (exclusive of above establishments) there is :—

| DETAIL.                            |     | MAUNDAGE AVAILABLE |                    |
|------------------------------------|-----|--------------------|--------------------|
|                                    |     | On<br>" A. Scale." | On<br>" B. Scale." |
| *1 Transport Troop, &c., Rohilkund | ... | 992                | 1,122              |
| 4 " " of 2 Punjab Brigades         | ... | 4,032              | 4,642              |
| From Bombay Circles (Table B)      | ... | 5,700              | 6,106              |
| TOTAL                              | ... | 10,724             | 11,970             |

\* The whole included for reason given in para. 75.

or sufficient for 9,000 men with their transport establishments, and 10 per cent. spare animals.

There is no reason why the two troops in Scinde should not also be added, which would allow the force being 10,000 men.

Mobilization in Madras (Burma.) 78. For a mobilization of 5,000 men in Burma (the weakest part of the Madras area), requiring 6,008 maunds (exclusive of that for transport establishments, &c.) there is available—

| DETAIL.                                                         |     | MAUNDAGE AVAILABLE |                    |
|-----------------------------------------------------------------|-----|--------------------|--------------------|
|                                                                 |     | On<br>" A. Scale." | On<br>" B. Scale." |
| 3 Transport Troops, &c., with Burmese Force                     | ... | 3,598              | 3,953              |
| From Rangoon Circle (Table B)                                   | ... | 1,200              | 1,296              |
| Mobile transport of the Madras Circles as per Col. 7 of Table B | ... | 3,800              | 4,056              |
| TOTAL                                                           | ... | 8,598              | 9,305              |

or sufficient for 7,000 men and their transport establishments, with 10 per cent. of spare animals.

Mobile transport for seaboard or distant point. 79. The mobile transport available for despatch to the seaboard or other distant point is as follows :—

| DETAIL.                                      | MAUNDAGE AVAILABLE    |                       |
|----------------------------------------------|-----------------------|-----------------------|
|                                              | On the<br>"A. Scale." | On the<br>"B. Scale." |
| From Rawulpindee Circle (Table B) ...        | 1,400                 | 1,584                 |
| " Lahore Circle " ...                        | 1,200                 | 1,236                 |
| " Meerut Circle " ...                        | 1,400                 | 1,584                 |
| " Seepree Circle " ...                       | 1,200                 | 1,236                 |
| " Lucknow Circle " ...                       | 600                   | 624                   |
| " Allahabad Circle " ...                     | 1,600                 | 1,668                 |
| " Calcutta Circle " ...                      | 600                   | 624                   |
| " Assam Circle (2 S. D. Mules) (Table B) ... | 400                   | 490                   |
| " Bombay Circles " ...                       | 3,800                 | 4,056                 |
| " Madras Circles " ...                       | 5,000                 | 5,304                 |
| TOTAL ...                                    | 17,200                | 18,406                |

or sufficient to equip on the hot weather scale 14,000 men together with extra transport for the baggage, and tents of their transport establishments and 10 per cent. spare animals.

There would, however, with the present scheme be no difficulty in adding to the above the mule subdivisions of the forces not guarding frontiers, and this would enable the strength of this force to be increased to 16,500 men.

Regarding transport for a distant point not the seaboard, see also para. 122a. (Section IX).

#### SECTION VII.—ORGANIZATION OF THE VARIOUS TROOPS AND CADRES.

Main details of  
interior organi-  
zation.

80. Main details are in Form F.; minor ones in  
Tables I to XVI.

(a.) Except the special troops (*viz.*, the Elephant Troops, the the Coolie Corps, and the P. F. Force Troops) the regular organization is 5 subdivisions, each carrying 200 maunds, besides its own baggage and spare animals, these again divided into four sections, each carrying 50 maunds besides its own baggage and spare animals, with additional transport for the Head-Quarters of the troop.

Each cadre is 1 subdivision, with certain extra establishments attached to it (Tables XII to XIV).

(b.) A limited number of the troops are given only 4 subdivisions and are called "reduced."

(c.) Every ordinary troop therefore (whether mule, camel, or "mixed") carries 1,000 maunds, and every reduced troop 800 maunds.

(d.) Of cart troops and pack bullock troops only the cadres are kept up in peace. They carry :—

|                    |                  |                     |
|--------------------|------------------|---------------------|
| A. T. Cart Troop   | (5 subdivisions) | ... 3,000 maunds.   |
| Country Cart Troop | ( " )            | ... 3,000 " "       |
|                    |                  | (no cadre kept up.) |
| Pack Bullock Troop | ( " )            | ... 2,000 maunds.   |
| Light Cart Troop   | ( " )            | ... 1,000 " "       |

(e.) A few "mixed" troops are necessary; they have one subdivision of mules and the rest camels. They may be either full or reduced troops.

(f.) The 4 P. F. Force troops have an irregular number of mules and camel subdivisions, but their interior organization is otherwise the same.

(g.) The 3 Elephant Troops and the Coolie Corps have special organizations, Tables VIII to XI. All other elephants are formed in independent sections; in peace these form part of the circle transport; in war any number of sections employed would be either grouped into a troop, or attached to any transport troop convenient.

(h.) All the above mentioned varieties of troops are for special circumstances; on service those employed would almost always be of three sorts only, *viz.*—

- (1.) Mule troops.
- (2.) Camel troops.
- (3.) Cart troops.

The mule troops being generally at the front, and the camel and cart troops on the communications. Here again is seen one of the many advantages of the system here advocated, *viz.*, that each class of transport can be sent with ease to that part of the theatre of war to which it is best adapted, whereas with Colonel Low's regimental transport (each including both mules, camels, and light carts) this would be impossible.

(i.) The circle transport usually consists of from 2 to 8 cadres, one of which is an A. T. Cart Cadre. In war as soon as any cadre is ordered to be completed to war strength an officer is appointed to it, and it ceases at once to belong to the circle command.

81. The organization of subdivisions, sections and "units," is a convenient one; a section, for instance, would give the amount required for one troop of native cavalry, for one gun R. A., and for half a company of infantry or sappers; a subdivision, for a half battery, two squadrons, or two companies infantry. Supposing a detachment to require 240 maunds, a subdivision with one section of another temporarily attached to it would be sent.

Should a regiment require 1,200 maunds, one troop with one subdivision of another temporarily attached would be sent.



For a guard or small party, one or two "units," and so on.

In no case would "units" ever be broken, for the existing system of detaching a driver with one or two mules throws the balance on other men to look after, with the result that all are neglected.

Nice calculations would be avoided; they look well on paper, but the alterations in strength of corps, the taking or not of one, two, or three days' rations, and a hundred other things make them practically useless.

To a general officer commanding it may safely be left to carry out the one general rule that no more transport is to be sent in each case than is necessary, as in the case of the other "arms."

82. The subdivisions are commanded by jamadars; these should not be confounded with the present transport jamadars who are men of no position or responsibility.

Those here referred to would be native officers, and of a respectable standing. Mule subdivisions, cart subdivisions, and pack bullock subdivisions and all cadre subdivisions are placed under first class jamadars; camel subdivisions under second class jamadars.

The sections are commanded by duffadars; each acting also as pay duffadar of his section. His books should be:—(1), an acquittance roll, and (2), an account of gear and equipment.

Two drivers in each section should be lance duffadars.

Ten per cent. of spare drivers are allowed in each subdivision.

One writer is given to each troop, and one moonsli to each cadre.

In all cases no more establishments are given than are actually required; no weighmen, peons, wheel greasers, gomashas, superfluous farriers and artificers, etc. The more men there are the less work and the greater pilfering: what is really important is that the full complement of drivers should be kept complete.

83. *Mule Troops.* (Table I.)—No gomashas are necessary, so one vehicle for robbery to Government is eliminated; weighmen and peons are only an excuse for idleness to the duffadars commanding sections, and another vehicle for pilfering; every duffadar distributes the grain for his own section, each driver having a seer measure.

A number of farriers is unnecessary, as mules should not be shod: one farrier per troop is allowed for paring feet, etc., if required.

Saddlers, on the other hand are most important, and one is given to each subdivision; carpenters, blacksmiths, bellowsmen and hammermen are not required in a troop of pack transport; extensive repairs to saddles would be done by the Ordnance Department, ordinary petty repairs by local labour, recovered for on contingent bills.

One salutri and one assistant salutri are given to the troop: also one writer who has charge of all books, etc., other than those kept in the sections.

Each duffadar and driver is allowed ten seers of baggage, and each section duffadar should be held responsible that this is not exceeded ; at present in every three mules, the load of three is often carried on two, and the third loaded with all sorts of miscellaneous articles, drivers' baggage, picketing gear, etc., etc., or else all three are overloaded.

At present picketing gear is carried anywhere, which means that it is always where it should not be. It should be properly rolled up and fitted at back of saddle.

Of the five head-quarter mules of the troop, one carries a pair of mule trunks fitted for medicines, the officer commanding the troop has two, the writer and office one, and the salutri and farrier one.

One mountain battery tent is carried in each section for the 12 men.

Each jamadar is allowed for tent and baggage two maunds, and a spare mule to ride whenever available.

84. *Camel Troop.* (Table II.)—Except in the P. F. Force all camels are hired, but the organization is the same as if Government property except that no salutries are included.

The jamadars and duffadars are paid Government servants ; where possible the jamadar should be the owner of the whole 46 camels of his subdivision, or else each duffadar should own those of his section.

The drivers should receive clothing. Baggage and tents are allowed on the scale named in para. 83. As those of one section only make half a camel load, the two flank sections of each subdivision carry that of both sections in the half subdivision ; thus 1 and 4 sections have 12 camels, while 2 and 3 have only 11. If a section is detached, a flank one is chosen.

85. *Mixed Troop.* (Table III.)—Each troop has one mule subdivision and the rest camels. The details are otherwise the same as above.

The head-quarters of the troop are carried as for a camel troop.

*The Punjab Frontier Force Troops.* (Tables IV to VII.)—Have Government camels, and one saddler, and one spare driver to each camel subdivision.

The head-quarters are carried as for a mule troop.

86. *Assam Elephant Troop.*—Full details in Table VIII.

*Burmese Elephant Troop.* (Table IX.)—The subdivisions are commanded by 1st class jamadars, 2nd class jamadars, or duffadars according to their size.

*Oude Elephant Troop.* (Table X.)—Subdivisions not necessary here ; a 1st class jamadar is given to each half troop.

*Assam Coolie Corps.* (Table XI.)—A writer is necessary to keep accounts of pay ; in peace the command is attached to the Assam Elephant Troop.

Cadre sub- 87. *Mule Cadre* (see Table I).—This cadre only differs from an ordinary subdivision in having a moonshi.

The establishments required to complete it to its war strength would be distributed on paper to their respective sections and subdivisions; it would be the chief duty of the moonshi to keep the nominal rolls corrected and complete (paras. 117—120.)

*Camel Cadre*.—As above, all cadres have 1st class jamadars.

*A. T. Cart Cadre*. (Table XII.)—To this subdivision are attached the following, belonging to the head-quarters of the troop :—

|            |            |
|------------|------------|
| 1 Captain. | 1 Farrier. |
| 1 Salutri. | 1 Writer.  |

During peace they will also do general work for all other cadres in the circle, which the Captain himself commands. Where in a circle there are two such cadres, only one of them has these head-quarters establishment; no wheel-greasers are allowed, the same tending to idleness in the drivers; every driver should grease his own wheels, just as he should be responsible for the cleanliness and efficiency of any other part of his gear.

The cost of these cadres in Bengal (where they have siege train bullocks and their establishments) is merely that of the few transport establishments required to make up the complement, viz. :—

|             |               |
|-------------|---------------|
| 1 Jamadar.  | 1 Carpenter.  |
| 1 Duffadar. | 1 Blacksmith. |
| 24 Drivers. | 1 Hammerman.  |
|             | 1 Bellowsman. |

*Light Cart Cadre*. (Table XIII.)—The establishments are those of a mule cadre; carpenters and blacksmiths will not be necessary for so few light carts during peace, but when the full troop is formed they are given.

*Pack Bullock Cadre*. (Table XIV.)—Bullocks are organized with the following differences from mules; as they require less supervision a larger number compose each command, and the section, subdivision, or troop carries double what such fractions do in other pack transport. As bullocks must be shod a farrier is given to each subdivision; an assistant salutri is given to the cadre.

*Regimental Mules*.—As per Table XV.

*Elephant Sections*.—As per Table XVI.

88. The tables showing cost in detail are not given in this paper.

The cost of feeding, clothing, repairing gear, of fresh animals and gear, etc., have all been taken at the same rates as are given in Colonel Low's estimates. The total annual cost of each troop or cadre, etc., (exclusive of officers who are shown separately) will be found in Col. 3 of Table G.

## SECTION VIII.—MISCELLANEOUS DETAILS.

*N.B.*—The details contained in this section, whether adopted or not, would not affect the scheme as a whole.

| Pay.               |     | 89. The monthly pay of the different ranks has been taken as follows:— |            |     |                                                | Rs.                                            |
|--------------------|-----|------------------------------------------------------------------------|------------|-----|------------------------------------------------|------------------------------------------------|
| Captain, Staff pay | ... | ...                                                                    | ...        | ... | ...                                            | 250                                            |
| Lieutenant „       | ... | ...                                                                    | ...        | ... | ...                                            | 150                                            |
| 1st class Jamadars | ... | ...                                                                    | ...        | 30  |                                                |                                                |
| 2nd „              | ... | ...                                                                    | ...        | 20  |                                                |                                                |
| Duffadars          | ... | ...                                                                    | ...        | 10  | } With compensation for dearness of provision. |                                                |
| Drivers            | ... | ...                                                                    | ...        | 6   |                                                |                                                |
| Writers            | ... | 40                                                                     | Blacksmith | ... | 15                                             |                                                |
| Salutries          | ... | 30                                                                     | Saddlers   | ... | 12                                             |                                                |
| Asst. Salutries    | ... | 20                                                                     | Carpenters | ... | 10                                             |                                                |
| Moonshies          | ... | 20                                                                     | Hammermen  | ... | 6                                              | } With compensation for dearness of provision. |
| Farriers           | ... | 15                                                                     | Bellowsmen | ... | 6                                              |                                                |

90. All transport establishments, except those of hired camel troops and writers, should be regularly enlisted. It is scarcely too much to say that the success of any scheme of transport will in great part depend on this.

No one, who takes the trouble to go into details, will long be doubtful of this, though at first sight the present system may appear sufficiently satisfactory.

At present these establishments, even during peace, desert largely, either whenever so strictly looked after as to be unable to rob Government, or at any prospect of employment in a more congenial locality; and, it should be remembered, that the desertions of even half-a-dozen mule drivers throws the work of feeding and attendance of 18 additional mules on other drivers, with the result that all are discontented and their animals ill cared for. In war many such desertions may paralyze a force.\*

Moreover, under the present system, unenlisted duffadars and jamadars rob almost with impunity; let no one think this matter of enlistment insignificant; the difference even in peace between transport mules and those of mule batteries is only caused by want of the same care and food as the former, and this can never be enforced without the discipline at present unattainable.

These establishments always have it in their power to cause much loss to Government, and it is therefore wise (1) to treat them well, and (2) to let them know that they are amenable to punishment under the Articles of War, which knowledge will be generally sufficient.

Enlistment might be for 10 years with opportunity for re-engagement for another ten years for pension; pension to be at rate of half

\* Sir Arthur Wellesley, 80 years ago, strongly advocated enlistment of all such establishments, and reported the paralysis to his movements caused by the want of it.

the pay. Duffadars and jamadars to re-engage for a third 10 years for increased pension. For death on service next of kin to receive the pension due after 20 years' service.

Men enlisted at an augmentation for war might be so "for one year or till close of campaign," at end of which the option of discharge or re-engagement for the usual period if wanted.

At the commencement, jamadars to be selected non-commissioned officers from native cavalry or infantry, and duffadars selected sowars or sepoys. The present transport jamadars and duffadars not as a rule to be kept, as they have been too long accustomed to the present system. These are of course only suggestions.

91. Trial by court martial should seldom be necessary; for  
 Punishments. drivers, Officers Commanding Transport Troops, and for duffadars and jamadars, General Officers Commanding, should have large powers of summary punishment; summary courts martial to be by the officer commanding the nearest native regiment.

92. Indents for forage to be as simple as possible; all the Com-  
 Indents. missariat should require is a district voucher for what they supply, and four words and a signature should suffice, viz., place, date, *number of rations* and class of animals; the actual amount supplied can always be worked out in offices afterwards; the ration for each class should be printed on the indent, and any discrepancy received be noted.

It should be an order that where no officer of transport is present the corps or department using the transport must give the indent; officers commanding regiments sometimes object to do this, supposing that a mistake in the quantities will entail pecuniary responsibility; whereas what is wanted is an officer's certificate that a certain number of Government animals have been rationed, and the heading of the indent should take this form. At present indents require a lot of calculations and two signatures, one to what is required and a second that it has been received, which is absurd.

93. All supplies of forage to be from the Commissariat  
 Supply of for- Department. The anomaly of two departments age. bidding against each other in the same market, and of mounted corps getting that for their horses from one and for their baggage animals from the other should never be seen again.

During peace in the few cases where the transport could not indent on a Commissariat agent, some system might perhaps be devised better than the present one of giving money for the road, only half of which goes to the animals.

Possibly on main routes indents, to be looked upon as cheques on the Commissariat Department, and to be paid for at the nearest Commissariat Office, and given to grain-sellers at the different stages, might do.

The loss saved to Government would allow of a slightly enhanced rate over local rates being paid on such "cheques," to balance any inconvenience to the grain-sellers, and the system would soon become known.

94. The Commissariat Department should be prohibited from issuing any grain unground. The loss by deaths caused to Government by such grain is enormous; and the department might just as reasonably be allowed to issue raw flour instead of bread as unground grain.

Lettering of troops. 95. All troops and cadres would be lettered as follows:—

|                                    |     |                                       |                                                              |
|------------------------------------|-----|---------------------------------------|--------------------------------------------------------------|
| 6 Mule Troops ...                  | ... | } 28 {                                | A/A, A/B, A/C, etc.,<br>up to A/Y.                           |
| 14 Mule Cadres ...                 | ... |                                       |                                                              |
| 5 Disembodied Mule Troops          | ... |                                       |                                                              |
| 4 Bullock Cadres                   | ... | } 21 {                                | B/A, B/B, B/C and B/D.<br>C/A, C/B, C/C, etc.,<br>up to C/W. |
| 4 Camel Troops ...                 | ... |                                       |                                                              |
| 12 Camel Cadres ...                | ... |                                       |                                                              |
| 7 Disembodied Camel Troops         | ... | } 12 {                                | D/A, D/B, D/C, etc.,<br>up to D/L.                           |
| 12 Mixed Troops including those of | ... |                                       |                                                              |
| P. F. Force ...                    | ... |                                       |                                                              |
| Assam Elephant Troop               | ... | } E/1, E/2, E/3, etc., up to<br>E/52. | E/A.                                                         |
| Burmese Elephant Troop             | ... |                                       | E/B.                                                         |
| Oude Elephant Troop                | ... |                                       | E/O.                                                         |
| 52 Elephant Sections               | ... | } A/1, A/2, A/3, etc.<br>L/1, L/2.    | C/1, C/2, C/3, etc.<br>A. C. C.                              |
| 20 A. T. Cart Cadres...            | ... |                                       |                                                              |
| 2 Light Cart Cadres                | ... |                                       |                                                              |
| 6 Disembodied Country Cart Troops  | ... | }                                     | A. C. C.                                                     |
| Assam Coolie Corps                 | ... |                                       |                                                              |

96. Where no officer of transport is present, the officer commanding the post is "ex-officio" commandant of any detached fraction temporarily, and to him their pay would be sent by their own commander when necessary.

97. General accounts of the troop or cadre are kept in its head-quarters; minor ones in the sections, so that the detaching of a section may cause no confusion.

98. Each duffadar is "ex-officio" the pay duffadar for his section (from 5 to 20 men).

Each jamadar will be responsible for everything connected with his subdivision.

Clothing. 99. The following should be given free on enlistment:—

- |      |                             |                                                   |
|------|-----------------------------|---------------------------------------------------|
| (1). | Khaki drill "Norfolk" Coat. |                                                   |
| (2). | Ditto                       | Loose Trousers.                                   |
| (3). | Puggery.                    | } To be kept up afterwards at his<br>own expense. |
| (4). | Puttees.                    |                                                   |
| (5). | One Blanket.                |                                                   |

Shoes to be any pattern he prefers. Special issues of clothing for service beyond frontier.

100. Transport drivers could never leave their animals to engage an enemy on the march, therefore should *not* be armed for this purpose, but like the artillery arm should be escorted by infantry or cavalry.

In camp, on the other hand, they should be able to assist in protecting their animals, and so reduce infantry guards; they should therefore have "tulwars."

101. The "Madras" pattern saddle is recommended, as in wet weather the "Ordnance" pattern allows rain to soak into the pad with the eventual result of a sore back, and, besides this, the Madras pattern can take a wounded man.

102. Kegs are recommended in preference to pukhals, as the latter wet both animals and gear, and are useless for many native troops.

103. Tents are not given to A. T. Cart Troops, as each cart should have under the body a light curtain on rollers each side, to let down inside the wheels, forming a shelter for two or three men.

104. Spare animals should not have saddles, as their being loaded is to be avoided.

105. Nothing causes such discontent as the difficulty of arranging for support of their families by transport establishments while on service. In a transport troop, however, this could be done as in a native regiment.

106. Correspondence (that bane of the fighting portion of the army) *must* be reduced to a minimum in a transport corps if the (more important) care of the Government animals is not to be put in the background.

The operations of the Ordnance and Commissariat Departments as regards elaborate returns, indents, accounts of gear, etc., should be restricted by authority, as the evil is greater in its effects on transport than on the other arms.

#### SECTION IX.—AUGMENTATION FOR WAR.

[N.B.—The arrangements in this Section, whether adopted or not, would not affect the rest of the scheme.]

107. In this section (which should be read with Table L) there are the following kinds of transport only :—

- (a.) Mules.
- (b.) Camels.
- (c.) Draught bullocks (for A. T. carts in store.)
- (d.) Country carts, with bullocks.
- (e.) Pack bullocks.

All troops are full troops, and there are no mixed troops.

Regarding (a) and (c), Table K shows what number of saddles and carts should be kept in store to complete cadres to a war footing ; should however such carts not be in store, an A. T. cart cadre would be completed to war strength by four subdivisions of country carts instead, each subdivision having 30 such carts in place of 51 A. T. carts (cl. 14, para. 34).

108. To supply a force in the field it has been estimated that (exclusive of their equipment) transport at the rate of three maunds per man per month is necessary. That for their equipment having been provided (Section VI), there remains a total required to be available from the various districts (paras. 14 and 29) of, in the Punjab, 30,000 maunds, in Bengal 30,000 maunds, in Bombay 24,000 maunds, and in Madras 15,000 maunds.

109. The above amount would be easily obtainable, *but would not be so obtained efficiently* unless organized before hand : it cannot be too often repeated that what a modern army requires is not merely a collection of so many animals and carts, but the same in an organized state, otherwise the army will be hampered in its movements, and its Government put to severe losses.

110. The amounts noted in para. 108 are supplied : (1), by the four disembodied subdivisions of each of the 52 cadres ; and (2), by the 18 entirely disembodied troops.

In Madras the completion of the ten peace cadres would more than suffice to provide the 15,000 maunds there required ; in Bengal and Bombay also the completion of cadres would nearly suffice ; but in the Punjab the completion of the cadres will only supply (on the "A" scale) 12,800 maunds out of a total of 30,000 required ; therefore, besides this, 12 disembodied troops have to be furnished by the Punjab ; from Bengal and Bombay are required each three such troops (para. 114 and Table L).

Disembodied transport to be drawn from the Punjab on an augmentation for war.

111. Taking first the 30,000 maunds required from the Punjab for a mobilization in that province, we have—



| Cadres completed to war strength as per Tables C and I, II and XII, also disembodied troops. | NO. OF ANIMALS AND CARTS REQUIRED TO COMPLETE EACH. |         |                                              |                                   |                             | EQUIVALENT IN MAUNDS. |               |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------|---------|----------------------------------------------|-----------------------------------|-----------------------------|-----------------------|---------------|
|                                                                                              | Mules.                                              | Camels. | A. T. Carts provided by Ordnance Department. | Draught Bullocks for A. T. Carts. | Country Carts with Bullocks | On "B" scale.         | On "A" scale. |
| <b>CADRES.</b>                                                                               |                                                     |         |                                              |                                   |                             |                       |               |
| To complete 4 mule cadres at 485 mules each ...                                              | 1,940                                               | ...     | ...                                          | ...                               | ...                         | 3,200                 | 3,880         |
| To complete 3 camel cadres at 186 camels each ...                                            | ...                                                 | 558     | ...                                          | ...                               | ...                         | 2,400                 | 2,790         |
| To complete 3 A. T. cart cadres at 204 carts and 462 bullocks ...                            | ...                                                 | ...     | 612                                          | 1,386                             | ...                         | 7,200                 | 7,344         |
| <b>Totals required to complete the cadres of the Rawulpindee and Lahore Circles ...</b>      | 1,940                                               | 558     | 612                                          | 1,386                             | ...                         | 12,800                | 14,014        |
| <b>DISEMBODIED TROOPS.</b>                                                                   |                                                     |         |                                              |                                   |                             |                       |               |
| To complete 4 mule troops at 605 each ...                                                    | 2,420                                               | ...     | ...                                          | ...                               | ...                         | 4,000                 | 4,840         |
| To complete 5 camel troops at 232 each ...                                                   | ...                                                 | 1,160   | ...                                          | ...                               | ...                         | 5,000                 | 5,800         |
| To complete 3 country cart troops at 150 carts each ...                                      | ...                                                 | ...     | ...                                          | ...                               | 450                         | 9,000                 | 9,000         |
| <b>Total disembodied transport to be drawn from the Punjab on augmentation for war ...</b>   | 4,360                                               | 1,718   | 612*                                         | 1,386                             | 450                         | 30,800                | 33,654        |

112. In arranging for the above, it is best to work through civil officers rather than through any other agency (whether military or semi-military), as the people know and are accustomed to obey them, and it is well to avoid multiplying authorities; at the same time much extra work must not be laid on overworked district officers.

113. Each district officer probably knows approximately the amount of transport his principal places can supply; at all events he can readily find out. The furnishing of such information, the decision as to what proportion each tehsel, &c., should furnish, and the nomination of respectable men recommended as jamadars and duffadars in the District Transport Troop, should be all that is required from the district officer.

Pending such reliable information, the following rough distribution has been made for the Punjab:—

114. With the exception of the Goojranwala district (cadre at Rawulpindee) the completion of each cadre to its war strength is allotted to that district in which the cadre is stationed in peace.

The duty of furnishing entire disembodied troops is allotted to districts, which have not to complete an existing cadre. The difference between the two is merely that required for one subdivision.

\* Should the Ordnance Department not be able to supply the 612 carts, a proportionate increase must be made to the country carts (paras. 34 and 107).

- (a) The districts of { Peshawur.  
Rawulpindee.  
Jhelum.  
Sealkote. } Each to complete one mule cadre (485 mules.)
- (b) The districts of { Rawalpindee  
Jhelum  
Sealkote } Each to complete one camel cadre (186 camels.)
- (c) The districts of { Goojranwala  
Lahore  
Ferozepore } Each to complete one A. T. cart cadre (462 bullocks with 204 carts from Arsenal.)
- (d) The districts of { Goordaspore  
Goojerat  
Hooshiarpore  
Kangra  
Mooltan  
Shahpore } Each to furnish one mule troop (605 mules.)
- (e) The districts of { Jhang  
Montgomery  
Sirsa } Each to furnish one camel troop (232 camels.)
- (f) The districts of { Umritsur  
Jullundur  
Loodiana } Each to furnish one country cart troop (150 carts.)

The districts of Umballa, Kurnal, Delhi, Goorgaon, Rohtak, and Hissar form part of the Bengal area, and are therefore not included above.

Amount supplied by each district in Punjab. 115. The total number of animals, &c., to be supplied by the districts of the Punjab would thus be (subject to the latter part of para. 113) :—

| DISTRICTS.   |          | No. OF ANIMALS AND CARTS EACH. |         |                                       |                           |                              |
|--------------|----------|--------------------------------|---------|---------------------------------------|---------------------------|------------------------------|
|              |          | Mules.                         | Camels. | A. T. Carts from Ordnance Department. | Bullocks for A. T. Carts. | Country Carts with Bullocks. |
| Peshawur     | District | 485                            | .....   | .....                                 | .....                     | .....                        |
| Rawulpindee  | "        | 485                            | 186     | .....                                 | .....                     | .....                        |
| Jhelum       | "        | 485                            | 186     | .....                                 | .....                     | .....                        |
| Sealkote     | "        | 485                            | 186     | .....                                 | .....                     | .....                        |
| Goojranwala  | "        | .....                          | .....   | 204                                   | 462                       | .....                        |
| Lahore       | "        | .....                          | .....   | 204                                   | 462                       | .....                        |
| Ferozepore   | "        | .....                          | .....   | 204                                   | 462                       | .....                        |
| Goordaspore  | "        | 605                            | .....   | .....                                 | .....                     | .....                        |
| Goojerat     | "        | 605                            | .....   | .....                                 | .....                     | .....                        |
| Hooshiarpore | "        | 605                            | .....   | .....                                 | .....                     | .....                        |
| Kangra       | "        | 605                            | .....   | .....                                 | .....                     | .....                        |
| Mooltan      | "        | .....                          | 232     | .....                                 | .....                     | .....                        |
| Shahpore     | "        | .....                          | 232     | .....                                 | .....                     | .....                        |
| Jhang        | "        | .....                          | 232     | .....                                 | .....                     | .....                        |
| Montgomery   | "        | .....                          | 232     | .....                                 | .....                     | .....                        |
| Sirsa        | "        | .....                          | 232     | .....                                 | .....                     | .....                        |
| Umritsur     | "        | .....                          | .....   | .....                                 | .....                     | 150                          |
| Jullundur    | "        | .....                          | .....   | .....                                 | .....                     | 150                          |
| Loodiana     | "        | .....                          | .....   | .....                                 | .....                     | 150                          |
| TOTAL        |          | 4,360                          | 1,718   | 612                                   | 1,386                     | 450                          |

Should the siege train bullocks who are with the A. T. cart cadres in peace have to be replaced, 108 additional bullocks will be required each, from the Goojranwala, Lahore, and Ferozepore districts.

Requirements from Bengal, Bombay, and Madras shewn in Table L.

116. As regards Bengal, Bombay and Madras the amounts required are shewn in Table L. The district distribution would be on the same principle, but pending the information noted in para. 113 is not attempted.

Arrangements for enrolling disembodied transport.

117. Taking, for instance, the mule cadre to be completed by the Jhelum district, the general arrangements for enrolling would be as follows:—

The cadre requires 485 mules, and the establishments noted in Col. 4 of Table I. These would be apportioned as recommended by the district officer among the tehseels, towns and larger villages of the district, one unit (six mules and two men) being the minimum from any one place. In districts where it was possible, each subdivision would be furnished by a separate tehseel.

Lists of the mules and men registered as forming the subdivision would be kept in each tehseel, and one for the whole four subdivisions in the district office, and duplicate copies in the cadre subdivision. The four men nominated as jamadars of the four subdivisions should be able to afford much assistance in getting fit men to enrol and in keeping the registers corrected, and they would be encouraged to take pride in getting good animals and men enrolled in their subdivision. The saddlers, salutries, farriers, etc., would all likewise be enrolled in their respective places.

If tact is shown in *inaugurating* the troop in district (especially if the jamadars are made much of) it will soon be considered a distinction to belong to the Government Transport Troop of the district, and such a feeling will of course be of the utmost benefit.

With this object the jamadars might be allowed to wear their swords, the duffadars their stripes, and all others a cloth badge with the letter of the troop. A district officer who understands the people would always find ways of making the movement popular.

No man should be taken without some sort of character, and all should understand that, if unable to join their troop when called out, it is incumbent on them to assist in finding a substitute. The jamadars should be able to lay their hands on plenty of substitutes.

118. It will be seen that the principle here adopted is that all should be told off on paper during peace to their respective places, so that when required there may be as little to be done as possible; at such times there will always be much work, and if these arrangements have to be added, it just makes the difference between confusion (involving waste of public money) and the reverse.

The real difficulty in this portion of the subject is one common to all schemes, *viz.*, to ensure the men required coming forward voluntarily when wanted, and to meet this there is only one way; if the Government offers sufficiently good terms they will do so, if not, they will not. The Government can easily discover what terms

Principle of present scheme of augmentation.

will draw the classes wanted ; as it will in war time be in urgent need of the transport and forced to pay any price demanded it will be the truest economy to offer liberal terms before that urgency commences. The following are merely suggested as possibly effecting the object :—

- (1) Liberal batta on conclusion of campaign to all who were enrolled six months before war broke out.
- (2) Liberal pension to families of those dying on service, who were enrolled six months before war broke out, a reduced rate to others.
- (3) Free kit on enlistment (*viz.*, when war is declared.)
- (4) Option of discharge at end of campaign, or of re-engagement if wanted.
- (5) Regular payment to families during absence.
- (6) Purchase at a liberal rate of all animals passed by a Committee.

Whether such terms will suffice can be determined only by enquiry ; if not the only way is to improve them.

Arrangements  
on augmentation  
for war being ordered.

119. The arrangements for calling out disembodied subdivisions or troops will be as follows :—

The first step is to appoint the Commandant (para. 45) ; he would at once proceed to the Head Quarters of the district, and with the assistance of the civil officer begin to collect his troop, sending at the same time his indents for gear, clothing, etc., to the Ordnance and Commissariat Departments.

The animals on the register would be brought in to the Head Quarters of the district, passed by a Committee, bought by the Commissariat Department, and made over to the officer. The men would be enlisted and instruction in their work commenced.

The above arrangements should not occupy more than a fortnight, and as soon as equipped the troop would be ready to march wherever ordered.

120. The officer commanding the A. T. cart cadre being “*ex-officio*” commandant of all the cadres of his circle should, as far as possible, visit annually the districts told off them to see the registers are kept up and make acquaintance with the jamadars and other head men—at all events those of his own troop.

Districts to be  
visited.

121. Before the newly embodied troop leaves the district the officer commanding should make over to the civil officer a list of the families of his men with the amounts they are to receive, which he would arrange to remit to the civil officer to be paid to the families as the latter might find best.

Payments to  
families.

122. The arrangements detailed in this Section provide for transport on the "A" scale, in the Punjab for 30,800 mds., in Bengal for 30,200 mds., in Bombay for 24,200 mds., and in Madras for 16,800 mds.

The mobile portion of this transport is able to provide transport for a total of 76,000 mds., or sufficient for one month's supplies for a force of 25,000 men.

Example of  
general capacities  
of scheme.

122 (a). As an example of what general capacities the scheme has, let us see what would be available for an advance in force into, say, Afghanistan.

The transport permanently on a war footing being in this scheme entirely independent of any particular regiments, it is unnecessary to consider whether or not particular corps are likely to be employed; all that is required is to order the transport troops in question to that part of the frontier where required; transport in their place being hired locally for local (peace) requirements.

(2) Suppose the transport with the following forces and circles is left intact, viz.—

- (1) Eastern Frontier Force.
- (2) Burmese Force.
- (3) Assam Circle.

Also that the elephants of all circles are left intact, and that only mobile transport is calculated upon from the Madras circles.

(3) The following transport troops on a war footing will be at once available, together with the regimental mules with the same forces :—

|                            |                            |   |     | Maundage<br>"A" scale. |
|----------------------------|----------------------------|---|-----|------------------------|
| Attached to Peshawur Force | 3 Troops with regtl. mules |   |     | 2,888                  |
| "                          | 3 Punjab Brigades          | 6 | " " | 6,048                  |
| "                          | Rohileund Force            | 1 | " " | 992                    |
| "                          | Scinde Force               | 2 | " " | 1,744                  |
| "                          | Quetta Force               | 3 | " " | 2,688                  |
| "                          | Punjab Frontier Force      | 4 | " " | 5,176                  |

Total, 19 fully-trained transport troops and  
1,068 regimental mules, with a maundage on  
the "A scale" of ... 19,536

(4) Besides these, the augmentation of peace cadres, etc., will give as follows (Tables B and L and paras. 34, 107, and 111) :—

Punjab—

|                             |                     |                     |                | Maundage<br>"A." Scale. |
|-----------------------------|---------------------|---------------------|----------------|-------------------------|
| 4 Mule Cadres completed     | to war strength     | 4 Mule Troops       | 4,000          | } 34,000 mds.           |
| 3 Camel Cadres              | ditto               | 3 Camel Troops      | 3,000          |                         |
| 3 A. T. Cart Cadres         | ditto               | 3 A. T. Cart Troops | 9,000          |                         |
| 4 (Disembodied) Mule Troops | called out          | 4 Mule Troops       | 4,000          |                         |
| 5 Ditto                     | Camel Troops        | ditto               | 5 Camel Troops |                         |
| 3 Ditto                     | Country Cart Troops | ditto               | 3 Cart Troops  | 9,000                   |

**Bengal—**

|   |                                       |   |                   | Maundage<br>"A." Scale. |
|---|---------------------------------------|---|-------------------|-------------------------|
| 4 | Mule Cadres completed to war strength | 4 | Mule Troops       | 4,000                   |
| 2 | Camel Cadres ditto                    | 2 | Camel Troops      | 2,000                   |
| 1 | Pack Bullock Cadre ditto              | 1 | Bullock Troop     | 2,000                   |
| 7 | A. T. Cart Cadres ditto               | 7 | A. T. Cart Troops | 21,000                  |
| 1 | (Disembodied) Camel Troop called out  | 1 | Camel Troop       | 1,000                   |
| 2 | Ditto Country Cart Troops ditto       | 2 | Cart Troops       | 6,000                   |
|   |                                       |   |                   | 36,000 mds.             |

**Bombay—**

|   |                                       |   |                   |             |
|---|---------------------------------------|---|-------------------|-------------|
| 4 | Mule Cadres completed to war strength | 4 | Mule Troops       | 4,000       |
| 5 | Camel Cadres ditto                    | 5 | Camel Troops      | 5,000       |
| 5 | A. T. Cart Cadres ditto               | 5 | A. T. Cart Troops | 15,000      |
| 1 | (Disembodied) Mule Troop called out   | 1 | Mule Troop        | 1,000       |
| 1 | Ditto Camel Troop ditto               | 1 | Camel Troop       | 1,000       |
| 1 | Ditto Country Cart Troop ditto        | 1 | Cart Troop        | 3,000       |
|   |                                       |   |                   | 29,000 mds. |

**Madras—**

|   |                                       |   |                   |             |
|---|---------------------------------------|---|-------------------|-------------|
| 2 | Mule Cadres completed to war strength | 2 | Mule Troops       | 2,000       |
| 3 | Pack Bullock Cadres ditto             | 3 | Bullock Troops    | 6,000       |
| 5 | A. T. Cart Cadres ditto               | 5 | A. T. Cart Troops | 15,000      |
|   |                                       |   |                   | 23,000 mds. |

Total 66 Troops carrying on "A" scale 122,000 mds.

Of these 66 troops all but 18 will have a nucleus (one subdivision out of five) fully trained in peace, so that by the time they reach the frontier the whole of each troop should be fairly trained and in order.

(5) Adding the two together we have—

|    |                                                             |       |                  | Maundage available<br>on the "A Scale." |
|----|-------------------------------------------------------------|-------|------------------|-----------------------------------------|
| 19 | fully trained transport troops with                         | 1,068 | regimental mules | ...                                     |
| 66 | transport troops completed from their peace to war strength | ...   | ...              | ...                                     |
|    |                                                             |       |                  | 19,536                                  |
|    |                                                             |       |                  | 121,000                                 |
|    |                                                             |       |                  | 141,536                                 |

The whole of these 85 transport troops have also additional transport for their own baggage and tents, the actual total transport provided being that on the "B scale," which will be found to amount to 158,000 maunds. As the large majority of the transport would be employed on the line of communications (on the staging system) the whole of that portion could supply this latter scale.

(6) The above 85 transport troops with their maundage of 141,500 mds. on the A scale of calculation, and 158,000 mds. on the B scale, can provide for the following:—

(a) For a force of 50,000 men, half of whom are at the front at a distance of 15 marches from the base (or bases), and remainder on the communications, allowing permanently transport for the

equipment on cold weather service scale of the whole force, and supply at the rate of 3 mds. per man per month, thus :—

|                                                                                                                                                   | A. Scale.<br>mds. | B. Scale<br>mds.          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------|
| For permanent equipment of 50,000 men...                                                                                                          | 50,000            | 56,000                    |
| For supply on staging system, of 25,000<br>men at distance of 15 marches at the<br>rate of 3 mds. per man per month }                             | .....             | 75,000                    |
| For supply at same rate, of 25,000<br>men on communications, supplementary<br>to their own permanent transport, as<br>above, wherever available } | .....             | 27,000                    |
|                                                                                                                                                   |                   | <hr/> Total 158,000 <hr/> |

(b) Or, for a force of 35,000 men similarly provided for, of whom half are at the front at a distance of 30 *marches* from the base.

(c) Or, for a force of 35,000 men complete with one month's supplies, supposing the whole were advancing together.

Thus : (The A scale of transport only being here available) :—

|                                                                     | A scale.<br>Maunds. |
|---------------------------------------------------------------------|---------------------|
| For equipment on cold weather service scale<br>of 35,000 men ... .. | 35,000              |
| For carriage of one month's supplies at 3<br>maunds per man ... ..  | 105,000             |
| Total required on the A scale ...                                   | <hr/> 140,000 <hr/> |

(7.) The massing of these 85 transport troops at, say, Peshawur and Quetta, in whatever proportion was required, would present no difficulty.

(8.) Steps would of course at once be taken throughout the country to purchase and stock depôts at the base with additional animals ready to meet the indents of the 85 troops as losses occurred.

(9.) If the above forces were required to be exceeded, or removed further from their base, the elephants of the various circles with the two camel troops and two light cart troops of the Madras area might be brought up, as well as steps taken to raise additional transport troops still leaving the transport in Assam and Burmah intact.

#### SECTION X.—CONCLUSION.

123. Wherever in past military history the most efficient transport has been organized, whether it is the "baggage corps" of Sir C. Napier in Scinde, or the "transport train" of the American war of Secession, or the "Lahore mule train" in Abyssinia, we always find that the organization selected by the commanders in question, as the result of much practical experience, is that of an *independent military*

*corps*, neither worked by a department nor distributed to regiments, and I feel confident that this is the only direction in which true success (the Egyptian expedition was not a test) will ever be obtained, and that by having a Transport Department (one-half of whose animals are distributed in minute fractions to regiment,\* and the other half scarcely even organized in name) a false sense of security is being maintained, the Government supposing that it has an organized transport service, while it has in fact only that which in war will resolve itself into its original elements, becoming a mere collection of animals and men, and which even in peace is not the best system which can be obtained for the money expended.

124. The advantages claimed for the present scheme over Colonel Low's are :—

(1). All transport available at any time for any transport work, without confusion or dislocation.

(2). All transport, down to the smallest fractions, completely equipped with additional transport for the baggage and tents of its own establishments, and with 10 per cent. of spare animals.

(3). Each class of transport (*viz.*, mules, camels, carts, etc.,) able to be sent without any difficulty to that part of the theatre of war to which it is adapted.

(4). Transport of equipped forces always available to assist in equipping any force mobilized, whether the regiments of the equipped force form part of such mobilized force or not.

(5). The utilization of transport of equipped forces not guarding frontiers for relief movements perfectly easy ; whereas very cumbersome and unsatisfactory with Colonel Low's transport.

(6). A larger amount of peace transport available for the mobilization of a force in every case.

(7). A regular organized system for the augmentation of peace cadres to a war footing, for which little or no attempt is made in Colonel Low's scheme.

(8). An immense reduction in correspondence, especially on service, since every case of transfer with Colonel Low's transport must entail nominal rolls, list of gear and accounts of pay.

(9). A more real *organization*, as well as a more complete system for supervision over minor details of interior economy.

(10). A commander knowing the number of transport troops would always know the number of maunds he had transport for.

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\* The idea of a "regimental transport," combined necessarily with a "general transport," appears to have been hastily seized by every writer on the subject, after the campaign of 1879-80, apparently with little better reason than that it was the system arrived at in the latter end of the war, and that the regimental transport possessed by P. F. Force Regiments was the most efficient in the war.

The defects of the system are not apparent under the special circumstances of those regiments, but their circumstances are very different from those of an army, or a combined force. The transport of a transport troop would be more efficient than the best regimental transport ever was.



(11). Nearly 1,000 more pack mules (the most expensive class of transport) provided.

(12). A saving to Government of  $1\frac{1}{2}$  and possibly 2 lakhs annually. (Footnote, Table B).

125. It is in no spirit of presumptuous or captious criticism of the scheme now being adopted that I have ventured to bring forward that here contained, but simply because I earnestly desire to see the Government of India possessed of the best transport service of any Government, because I strongly believe that this result is herein attainable and with a positive saving of money, and because, if attained, *the armed strength of India will have been doubled.*

126. In conclusion I would desire to take a very small example in illustration of how the two systems would work in practice, premising that one of the defects of the "regimental transport" is that the whole amount kept up in peace expressly for an emergency, by being distributed in minute fractions to a number of particular regiments, is, if required for use on a duty to which those regiments are not detailed, and other than the equipment of regiments, as absolutely wanting in any organization as formerly, not to mention the difficulty in collecting it.

Suppose an expedition of 5,000 men is to be sent into the Afridi hills from the Peshawur district, and that this force is to take with it eight days' supplies, the route being unsuited to wheeled vehicles or elephants.

The force is about equal to that equipped with half transport in the Peshawur district, and to simplify matters, let us suppose that that is the force selected.

(a) Taking Colonel Low's scheme we have the following required:—

|                                                  | Maunds.            |
|--------------------------------------------------|--------------------|
| Transport for force $3,026 \times 2 =$           | ... 6,052          |
| Eight days' supplies for 5,000 men, p. 8 of Col. |                    |
| Low                                              | ... 4,000          |
|                                                  | <hr/> 10,052       |
| Baggage and tents for transport establishments   |                    |
| and spare animals $\frac{10,052}{6} =$           | ... 1,675          |
|                                                  | <hr/> Total 11,727 |

And suppose this total is the amount required. Of this there is immediately available, with the regiments, less 522 maunds for light carts not able to accompany

|                   |                |                   |
|-------------------|----------------|-------------------|
| From Punjab Depôt | { 500 mules }  | ... 2,504 maunds. |
|                   | { 300 camels } | ... 2,500         |
|                   |                | <hr/> Total 5,004 |

To obtain the remainder (6,723 maunds, the chief part of which is required for departmental stores), the natural course would be to use that lying idle with the three Punjab Brigades; failing this it must be obtained from the districts.

The latter will take the longest time, and when collected it will be absolutely without any organization; it will also of course be all extra expense.

Suppose therefore it is settled to call up the transport of the three Punjab Brigades.

The total amount is 6,199 maunds, less (167 × 6) say 1,000 maunds carried by light carts not available in this case, leaving 5,199 maunds available, therefore a balance of 1,500 maunds (say 300 camels costing about Rs. 2,000 a month) must still be got from the districts.

It may be imagined that the collecting of their regimental transport from so many corps (21) will be a work of difficulty, entailing a good deal of making up of accounts, etc., but even when collected (and supplemented by the 1,500 maunds noted) it will be merely a number of small fractions without cohesion or real organization; yet for this portion, though on the eve of a march, some organization of some sort will have to be improvised before they can be set to their work of carrying the departmental stores. Even if we look into the equipped regiments of the force we do not find matters much better; taking one of the native infantry regiments, there will be 19 mules and 52 camels belonging originally to it; besides these there will be (according to the strength of the regiment, etc.) presumably 19 more mules and about 75 more camels which have been sent up from the depôt, but when we look for any interior organization among these mules and camels we find none.

Apparently it is intended that they shall be divided in some way or other between the companies, but not only must any such rough distribution be made on the eve of a march, but also it will be a perfectly arbitrary arrangement differing in every regiment according to its strength; the number of camels, etc., attached, either to each company or each regiment, do not form a section, subdivision, or any definite unit of transport, therefore as far as can be seen matters will be much the same as in the last campaign.

(b.) Taking now the same instance with the present scheme.

The amount required having been taken (including that for transport establishments and spare) at 11,727 maunds, we have available on the "B" scale—

|                                                           |       | Maunds.                |
|-----------------------------------------------------------|-------|------------------------|
| 3 Transport troops and regimental<br>mules with the force | } ... | ... 3,328              |
| From Rawulpindee                                          |       | 4 mule cadres ... 960  |
|                                                           |       | 3 camel cadres ... 690 |
|                                                           | Total | ... 4,978              |

With each of the three Punjab Brigades are two troops. These six troops being ordered up will give (with regimental mules) as follows :—

|                                 |     |     |     | Maunds.   |               |
|---------------------------------|-----|-----|-----|-----------|---------------|
| As above                        | ... | ... | ... | ...       | 4,978         |
| Two troops and regimental mules |     |     | ... | 1st. Bde. | 2,326         |
| " "                             | " " | " " | ... | 2nd. Bde. | 2,316         |
| " "                             | " " | " " | ... | 3rd. Bde. | 2,326         |
|                                 |     |     |     | Total     | <u>11,946</u> |

So that no hired transport from districts is necessary.

The seven cadre subdivisions would be probably most conveniently attached each to one of the nine formed troops, but might, if preferred, be formed into temporary tenth troop for the expedition. Regimental mules would be simply ordered to be transferred by a regiment at, say, Umballa to one of those in the column.

The above nine transport troops would be the transport with the force moving into the Afridi country. Each is ready on the very day of its arrival at Peshawur to be put to any work required whether with regiments or departments; every section, subdivision or troop being thoroughly complete in its organization would have been entirely undisturbed by the change in its sphere of work; every driver's baggage even has its place in its own proper section; all would be working under the same commanders at Peshawur as at Mooltan or elsewhere, and nothing would have been thrown out of gear at a time when such matters being out of gear means great confusion.

I cannot but think that the whole operation would present a complete contrast to the other, and that the force would start equipped for its work as no force has ever yet started, and with its commander's mind feeling a relief on the subject such as no commander has ever yet felt.

PESHAWUR, 10th February 1883.

TABLE A.

Showing requirements and allotments of transport for each of the Forces which are to be equipped with half Transport.

1 S. D. = 1 Sub-Division.  
 $\frac{1}{2}$  =  $\frac{1}{2}$  Sub-Division, i.e., 1 Section.

N.B.—The Quetta Force is exceptional, having a moveable column with full Transport.

| 1                        | 2                                                  | 3   | 4                        | 5                              | 6                                                                          | 7                                                                       | 8                                                                                                                        | 9                                                                                                                                                                    |
|--------------------------|----------------------------------------------------|-----|--------------------------|--------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DETAIL OF THE FORCE.     |                                                    |     |                          |                                |                                                                            |                                                                         |                                                                                                                          |                                                                                                                                                                      |
|                          | Regimental mules for tools, ammunition, and water. |     | Total manndage required. | TRANSPORT ALLOTTED.            | SCALE                                                                      |                                                                         | Total number of animals with each force, including those required for the Transport Establishments and also Regtl. Mules | PROBABLE CONVENIENT DISTRIBUTION.                                                                                                                                    |
|                          | exclusive of regimental mules.                     |     |                          |                                | "A."                                                                       | "B."                                                                    |                                                                                                                          |                                                                                                                                                                      |
|                          | Mansuages required by each.                        |     |                          |                                | Being total manndage available exclusive of that for the Transport Rablts. | Being total manndage available, including that of the Transport Rablts. |                                                                                                                          |                                                                                                                                                                      |
| PERHAWAR FORCE.          |                                                    |     |                          |                                |                                                                            |                                                                         |                                                                                                                          |                                                                                                                                                                      |
| 2 Regt. British Infantry | 48                                                 | 600 | 1,000                    | 2 Mixed Troops (reduced) ...   | 1,600                                                                      | 1,890                                                                   | 280                                                                                                                      | For 2 B. I. at $2\frac{1}{2}$ Camel S. D. each = 5 Camel S. D. = 1 Camel Troop.                                                                                      |
| 3 " Native "             | 72                                                 | 300 | 900                      | and                            | ...                                                                        | ...                                                                     | 240                                                                                                                      | For 3 N. I. at $1\frac{1}{2}$ Camel S. D. each = $4\frac{1}{2}$ Camel S. D.                                                                                          |
| 2 " Cavalry "            | ...                                                | 150 | 300                      | 1 Camel Troop (full)           | 1,000                                                                      | 1,160                                                                   | ...                                                                                                                      | " 2 R. A. at $\frac{1}{2}$ Camel each = $1\frac{1}{2}$ Camel S. D.                                                                                                   |
| 2 Field Batteries        | ...                                                | 24  | 48                       | ...                            | ...                                                                        | ...                                                                     | 232                                                                                                                      | " 2 N. C. at $\frac{1}{2}$ Mule each = $1\frac{1}{2}$ Mule S. D.                                                                                                     |
| 2 Co. Sappers            | ...                                                | 144 | 288                      | In addition to 144 Regl. Mules | 288                                                                        | 288                                                                     | 144                                                                                                                      | " 2 Sappers at $\frac{1}{2}$ Mule each = $\frac{1}{2}$ Mule S. D.                                                                                                    |
| Add equivalent of        | ...                                                | ... | 2,881                    | ...                            | 2,888                                                                      | 3,328                                                                   | 34                                                                                                                       | N.B.—Each Sub-Division carries 200 maunds.<br>Each Section carries 50 maunds.                                                                                        |
| Totals                   | ...                                                | ... | ...                      | ...                            | ...                                                                        | ...                                                                     | 512                                                                                                                      |                                                                                                                                                                      |
| 1st PUNJAB BRIGADE.      |                                                    |     |                          |                                |                                                                            |                                                                         |                                                                                                                          |                                                                                                                                                                      |
| 1 Regt. British Infantry | 24                                                 | 500 | 500                      | 1 Mixed Troop (full)           | 1,000                                                                      | 1,170                                                                   | 120                                                                                                                      | For 1 Mtn. Bty. 1 Mule S. D. (at Murree).<br>" 1 B. I. $2\frac{1}{2}$ Camel S. D. (at R. Pindee).<br>" 1 N. I. $1\frac{1}{2}$ " " (ditto).                           |
| 3 " Native "             | 72                                                 | 300 | 900                      | and                            | ...                                                                        | ...                                                                     | 186                                                                                                                      | or 1 Mixed Troop (full).                                                                                                                                             |
| 1 " Cavalry "            | ...                                                | 150 | 300                      | 1 Mixed Troop (reduced)        | 800                                                                        | 940                                                                     | 120                                                                                                                      | " H. Q. R. Pindee.                                                                                                                                                   |
| 1 Mountain Battery       | ...                                                | 12  | 48                       | ...                            | ...                                                                        | ...                                                                     | 140                                                                                                                      | or 1 Mixed Troop (reduced).                                                                                                                                          |
| 1 Co. Sappers            | ...                                                | 108 | 216                      | In addition to 108 Regl. Mules | 216                                                                        | 216                                                                     | 108                                                                                                                      | " 1 N. I. $1\frac{1}{2}$ Camel S. D. (at Sealkote).<br>" 1 N. I. $1\frac{1}{2}$ " " (at Sealkote).<br>" 1 N. I. $1\frac{1}{2}$ " " (at Jhelum).<br>" H. Q. Sealkote. |
| Add equivalent of        | ...                                                | ... | 1,970                    | ...                            | 2,016                                                                      | 2,326                                                                   | 348                                                                                                                      |                                                                                                                                                                      |
| Totals                   | ...                                                | ... | ...                      | ...                            | ...                                                                        | ...                                                                     | 326                                                                                                                      |                                                                                                                                                                      |

TABLE A.—(Continued.)

| 1                        | 2                                                  | 3                                                         | 4                        | 5                              | 6                                                                   | 7                                                                                        | 8                                 | 9                                                                                                                                             |
|--------------------------|----------------------------------------------------|-----------------------------------------------------------|--------------------------|--------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| DETAIL OF THE FORCE.     | Regimental Mules for tools, ammunition, and water. | Manumage required by each, exclusive of Regimental Mules. | Total manumage required. | TRANSPORT ALLOTTED.            | "A." SOLE SCALAR Being manumage available for the Transport Rattle. | "B." SOLE SCALAR Being total manumage available, including that of the Transport Rattle. | Probable Convenient Distribution. |                                                                                                                                               |
|                          |                                                    |                                                           |                          |                                |                                                                     |                                                                                          | Mules.                            | Camels. | Blephits |
| 2ND PUNJAB BRIGADE.      |                                                    |                                                           |                          |                                |                                                                     |                                                                                          |                                   |                                                                                                                                               |
| 1 Regt. British Infantry | 24                                                 | 500                                                       | 500                      | 1 Mixed Troop (full)           | 1,000                                                               | 1,170                                                                                    | 120                               | For 1 N. C. ½ Mule S.D. (at Mooltan),<br>" 1 Sappers ½ " (at Roorkhee),<br>" 1 B. I. ½ Camel S.D. (at Mooltan),<br>" 1 N. I. 1 ½ " " (ditto). |
| 3 " " Native Cavalry     | 72                                                 | 300                                                       | 900                      | and                            | 800                                                                 | 930                                                                                      | 186                               | or 1 Mixed Troop (full),<br>H. Q. Mooltan.                                                                                                    |
| 1 " " " Cavalry          | 150                                                | 150                                                       | 150                      | 1 Camel Troop (reduced)        | 800                                                                 | 930                                                                                      | ...                               | or 1 Camel S.D. (at Roorkhee),<br>H. Q. Mooltan.                                                                                              |
| 1 Field Battery          | 12                                                 | 48                                                        | 48                       |                                | 216                                                                 | 216                                                                                      | 108                               | For Field Battery, 1 Camel S.D. (at Meer Meer),<br>" 1 N. I. 1 ½ " " (ditto),<br>" 1 N. I. 1 ½ " " (at Bakloh).                               |
| 1 Co. Sappers            | 108                                                | 108                                                       | 216                      | In addition to 108 Regl. Mules | 2,016                                                               | 2,316                                                                                    | 228                               | or 1 Camel S.D. (at Meer Meer).                                                                                                               |
| Add equivalent of        | ...                                                | ...                                                       | 1,964                    |                                |                                                                     |                                                                                          |                                   |                                                                                                                                               |
| Totals                   | ...                                                | ...                                                       | ...                      |                                |                                                                     |                                                                                          |                                   |                                                                                                                                               |
| 3RD PUNJAB BRIGADE.      |                                                    |                                                           |                          |                                |                                                                     |                                                                                          |                                   |                                                                                                                                               |
| 1 Regt. British Infantry | 24                                                 | 500                                                       | 500                      | 1 Mixed Troop (full)           | 1,000                                                               | 1,170                                                                                    | 120                               | For 1 Mtn. Btry, 1 Mule S.D. (at Jutogh),<br>" 1 B. I. 2 ½ Camel S.D. (at Umballa),<br>" 1 N. I. 1 ½ " " (at Jullunder).                      |
| 3 " " Native Cavalry     | 72                                                 | 300                                                       | 900                      | and                            | 800                                                                 | 940                                                                                      | 120                               | or 1 Mixed Troop (full),<br>H. Q. Umballa.                                                                                                    |
| 1 " " " Cavalry          | 156                                                | 156                                                       | 156                      | 1 Mixed Troop (reduced)        | 216                                                                 | 216                                                                                      | 108                               | For 1 N. C. ½ Mule (at Umballa),<br>" 1 Sappers ½ " (at Roorkhee),<br>" 1 N. I. 1 ½ Camel S. D (at Dehra),<br>" 1 N. I. 1 ½ " " (at Agra).    |
| 1 Mountain Battery       | 12                                                 | 48                                                        | 48                       |                                | 2,016                                                               | 2,326                                                                                    | 348                               |                                                                                                                                               |
| 1 Co. Sappers            | 108                                                | 108                                                       | 216                      | In addition to 108 Regl. Mules |                                                                     |                                                                                          | ...                               |                                                                                                                                               |
| Add equivalent of        | ...                                                | ...                                                       | 1,970                    |                                |                                                                     |                                                                                          |                                   |                                                                                                                                               |
| Totals                   | ...                                                | ...                                                       | ...                      |                                |                                                                     |                                                                                          |                                   |                                                                                                                                               |

|                                |     |     |       |                                |     |       |       |       |     |
|--------------------------------|-----|-----|-------|--------------------------------|-----|-------|-------|-------|-----|
| <b>SWAT FORCES.</b>            |     |     |       |                                |     |       |       |       |     |
| 1 Regt. British Infantry       | 24  | 500 | 500   | 1 Mixed Troop (reduced)        | ... | 800   | 940   | 120   | 140 |
| 2 " " Native Cavalry           | 48  | 300 | 300   | and                            | ... | ...   | ...   | ...   | ... |
| 1 " " " "                      | ... | 100 | 100   | 1 Camel Troop (reduced)        | ... | 800   | 930   | ...   | 186 |
| 1 Field Battery                | ... | ... | ...   | ...                            | ... | 14    | 144   | 72    | ... |
| Add equivalent of ...          | 72  | =   | 144   | In addition to 72 Regl. Mules  | ... | 1,714 | 2,014 | 182   | 326 |
| Totals                         | ... | ... | 1,544 | ...                            | ... | ...   | ...   | ...   | ... |
| <b>PORTLAND FORCES.</b>        |     |     |       |                                |     |       |       |       |     |
| 1 Regt. British Infantry       | 24  | 500 | 500   | 1 Camel Troop (reduced)        | ... | 800   | 930   | ...   | 186 |
| 1 " " Native                   | 24  | 300 | 300   | ...                            | ... | ...   | ...   | ...   | ... |
| 2 Guns Field Battery           | 23* | ... | ...   | ...                            | ... | ...   | ...   | ...   | ... |
| 1 Squadn. Native Cavalry       | 25* | ... | ...   | ...                            | ... | ...   | ...   | ...   | ... |
| Add equivalent of ...          | 96  | =   | 192   | In addition to 96 Regl. Mules  | ... | 192   | 192   | 96    | ... |
| Totals                         | ... | ... | 992   | ...                            | ... | 992   | 1,122 | 96    | 186 |
| <b>PUNJAB FRONTIER FORCES.</b> |     |     |       |                                |     |       |       |       |     |
| 9 Regts. Native Infantry       | 216 | 300 | 2,700 | Hazara Transport Troop         | ... | 1,200 | 1,440 | 605   | 46  |
| 2 " " " (in Hazara)            | 48  | 300 | 600   | Kohat                          | ... | 1,200 | 1,440 | 365   | 138 |
| 2 " " " " "                    | 150 | 600 | 600   | Dera Ismail                    | ... | 1,600 | 1,800 | 435   | 182 |
| 1 " " " " (at Kohat)           | 21* | 100 | 100   | Dera Ghazi                     | ... | 600   | 720   | 245   | 46  |
| 5 Mountain Batteries           | ... | 100 | 500   | ...                            | ... | ...   | ...   | ...   | ... |
| Add equivalent of ...          | 288 | =   | 576   | In addition to 288 Regl. Mules | ... | 576   | 576   | 288   | ... |
| Totals                         | ... | ... | 5,076 | ...                            | ... | 5,176 | 6,046 | 1,985 | 414 |

For 1 W. C. 1 Mule S. D. (200 maunds).  
 " 2 N. I. 3 Camel S. D. (600 maunds).  
 or 1 Mixed Troop (reduced.)  
 3 Camel S. D.  
 1 Mule S. D.

For 1 Field Baty. 1 Camel S. D. (200 maunds).  
 " 1 B. I. 3 Camel S. D. (600 maunds).  
 or 1 Camel Troop (reduced.)  
 3 Camel S. D.

For 1 B. I. 2½ Camel S. D. } or 1 Camel Troop (reduced.)  
 " 1 N. I. 1½ " " }

\* The two guns require transport for 48 maunds; the squadron for 60 maunds. As a special case they are allowed this in Regimental Mules.

For each Mountain Battery is given 2 Section Mules.  
 " " N. Infy. in Hazara " 1½ S.D. Mules.  
 " " " elsewhere " 1½ Mule.  
 " " " N. O at Murdan and Dera Ismail 1 S.D. Camel.  
 " " " at Dera Ghazi and Rajapore ½ " "  
 " " " " at Kohat ½ Regimental Mules.

Statement showing distribution of above to Frontier Stations and Regiments.

|                             |         |     |       |                          |                                  |       |       |     |     |
|-----------------------------|---------|-----|-------|--------------------------|----------------------------------|-------|-------|-----|-----|
| Abbottabad                  | 1 M. B. | 100 | 100   | 2 Mule                   | ...                              | 100   | 120   | 60  | ... |
|                             | 3 N. I. | 48  | 300   | 3 S.D. Mule              | ...                              | 600   | 720   | 360 | ... |
| Murdan                      | 1 N. O. | 150 | 150   | 1 S.D. Mule              | ...                              | 200   | 240   | 120 | ... |
|                             | 1 N. I. | 24  | 300   | 3 Mules and 1 S.D. Camel | ...                              | 300   | 360   | 60  | 46  |
| Also 5 Mules H. Q. of Troop |         | ... | ...   | ...                      | ...                              | 10    | 10    | 5   | ... |
| Equivalent of ...           |         | 72  | =     | 144                      | In addition to 72 Regl. Mules... | 144   | 144   | 72  | ... |
| Totals                      |         | ... | 1,294 | ...                      | ...                              | 1,354 | 1,583 | 677 | 46  |

= { 5 S.D. Mule } = Hazara Troop.  
 { 1 " Camel }

TABLE A.—(Continued.)

| 1                                                           | 2                                                   | 3                                                        | 4                       | 5                                | 6                                                                   | 7                                                                                     | 8                               | 9                                                                                                                                         |
|-------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------|-------------------------|----------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             |                                                     |                                                          |                         |                                  |                                                                     |                                                                                       |                                 |                                                                                                                                           |
| DETAIL OF THE FORCE.                                        | Regimental Mules, for tools, ammunition, and water. | Mandage required by each, exclusive of Regimental Mules. | Total mandage required. | TRANSPORT ALLOTTED.              | Being mandage available, exclusive of that for the Transport Berbs. | "A." "B." SCALE Being total mandage available, including that of the Transport Berbs. | Mules.<br>Camels.<br>Elephants. | Total number of animals with each force, including both those required for the Transport Estates, liabilities, and also Regimental Mules. |
|                                                             |                                                     |                                                          |                         |                                  |                                                                     |                                                                                       |                                 |                                                                                                                                           |
| Kohat<br>... { 2 M. B.<br>1 N. C.<br>3 N. I. ...            | 100                                                 | 100                                                      | 200                     | 4 M. B. Mule ...                 | 200                                                                 | 240                                                                                   | 120                             | { 3 S.D. Mule }<br>{ 3 " Camel } = Kohat Troop.                                                                                           |
|                                                             | 24*                                                 | 100                                                      | 100                     | 1 S.D. Mule and 3 S.D. Camel.    | 100                                                                 | 120                                                                                   | 60                              |                                                                                                                                           |
|                                                             | 72                                                  | 300                                                      | 900                     | Also 5 Mules H. Q. of Troop ..   | 900                                                                 | 1,050                                                                                 | 180                             |                                                                                                                                           |
| Equivalent of ...                                           | 96                                                  | =                                                        | 192                     | In addition to 96 Regl. Mules..  | 192                                                                 | 192                                                                                   | 96                              | * The Cavalry Regiment at Kohat is allowed part of its transport in Regimental Mules as a special case.                                   |
| Totals                                                      | ...                                                 | 1,392                                                    | 1,392                   |                                  | 1,402                                                               | 1,612                                                                                 | 461                             |                                                                                                                                           |
| Bunoo<br>... { 1 M. B.<br>2 N. I. ...                       | 100                                                 | 100                                                      | 100                     | 2 Mule ...                       | 100                                                                 | 120                                                                                   | 60                              |                                                                                                                                           |
| Dera Ismail Khan<br>... { 1 M. B.<br>1 N. C.<br>2 N. I. ... | 48                                                  | 300                                                      | 600                     | 1 S.D. Mule and 2 S.D. Camel     | 600                                                                 | 700                                                                                   | 120                             | { 4 S.D. Mule }<br>{ 4 " Camel } = Dera Ismail Troop.                                                                                     |
|                                                             | 18*                                                 | 100                                                      | 100                     | 1 Mule ...                       | 100                                                                 | 120                                                                                   | 60                              |                                                                                                                                           |
|                                                             | 48                                                  | 300                                                      | 600                     | Also 5 Mules H. Q. of Troop ..   | 200                                                                 | 240                                                                                   | 120                             |                                                                                                                                           |
| Equivalent of ...                                           | 96                                                  | =                                                        | 192                     | In addition to 96 Regl. Mules .. | 192                                                                 | 192                                                                                   | 96                              | { 2 S.D. Mule }<br>{ 1 " Camel } = Dera Ghazi Troop.                                                                                      |
| Totals                                                      | ...                                                 | 1,742                                                    | 1,742                   |                                  | 1,802                                                               | 2,032                                                                                 | 681                             |                                                                                                                                           |
| Dera Ghazi Khan<br>... { 1 N. C.<br>1 N. I. ...             | 150                                                 | 150                                                      | 150                     | 1 Mule ...                       | 150                                                                 | 180                                                                                   | 90                              |                                                                                                                                           |
| Rajapore<br>... 1 N. C. ...                                 | 24                                                  | 300                                                      | 300                     | 1 Mule and 1 S.D. Camel          | 300                                                                 | 350                                                                                   | 60                              | N.B.—All Camels in these four Troops are Government property, Tables VII to X.                                                            |
|                                                             | ...                                                 | 150                                                      | 150                     | 1 Mule ...                       | 150                                                                 | 180                                                                                   | 90                              |                                                                                                                                           |
|                                                             | ...                                                 | ...                                                      | ...                     | Also 5 Mules H. Q. of Troop ..   | 10                                                                  | 10                                                                                    | 5                               |                                                                                                                                           |
| Equivalent of ...                                           | 24                                                  | =                                                        | 48                      | In addition to 24 Regl. Mules..  | 48                                                                  | 48                                                                                    | 24                              |                                                                                                                                           |
| Totals                                                      | ...                                                 | ...                                                      | 648                     |                                  | 658                                                                 | 798                                                                                   | 269                             |                                                                                                                                           |







Statement showing total number of Animals, &amp;c., for Assam.

| STATION.          |     | Regimental<br>Mules. | Troop Mules. | Total Mules. | Elephants. | Sirdars. | Mates. | Coolies. | Boats. | REMARKS.                                                  |
|-------------------|-----|----------------------|--------------|--------------|------------|----------|--------|----------|--------|-----------------------------------------------------------|
| Kohima            | ... | 24                   | ...          | 24           | ..         | 11       | 21     | 714      | ...    | The 6 boats<br>have a total<br>capacity of 350<br>maunds. |
| Dibrugarh         | ... | ...                  | ...          | ...          | 24         | ..       | ...    | ...      | ...    |                                                           |
| Shillong          | ... | 24                   | 90           | 114          | 13         | ..       | ...    | ...      | ...    |                                                           |
| Teachar           | ... | 24                   | 30           | 54           | 12         | 3        | 7      | 238      | ...    |                                                           |
| Mountain Battery  | ... | ...                  | 120          | 120          | ..         | ..       | 8      | 273      | 6      |                                                           |
| Circle in General | ... | ...                  | 245          | 245          | 37         | 4        | ...    | ...      | ...    |                                                           |
| Totals            |     | ...                  | ...          | 557          | 85         | 18       | 36     | 1,224    | 6      |                                                           |

NOTE.—That throughout the above Table “ $\frac{1}{2}$  S.D.” signifies “1 Section and carries 50 maunds; except in the Coolie Corps, where 1 Section is written thus “ $\frac{1}{2}$  S.D.” and carries 17 maunds.

TABLE B.

*Showing Allotment of Transport to the various Circles and the amount they are able to supply for ordinary local requirements (Col. 4), for a mobilization in their area (Cols. 5 and 6), or for despatch by rail to the Seaboard or other distant point (Col. 7).*

| 1                | 2                                                                                                                  | 3                                                                                       | 4           |         |                |                       | 5                       | 6          | 7                                                                            |           |                                                                                 |           | REMARKS. |             |                |                         |                       |                                                                                                                                    |
|------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------|---------|----------------|-----------------------|-------------------------|------------|------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------|-----------|----------|-------------|----------------|-------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------|
| CIRCLE.          | Stations included in the Circle, and among which the transport of this Table and of Table A. would be distributed. | Transport allotted.                                                                     | TRANSPORT.  |         |                |                       | MAUNDAGE.               |            | MOBILE TRANSPORT FOR DESPATCH BY RAIL.                                       |           |                                                                                 |           |          |             |                |                         |                       |                                                                                                                                    |
|                  |                                                                                                                    |                                                                                         | Pack Mules. | Camels. | Pack Bullocks. | Army Transport Carts. | Light Carts with Mules. | Elephants. | Being Maundage available, exclusive of that of the Transport Establishments. | A. Scale. | Being total Maundage available, including that of the Transport Establishments. | B. Scale. |          | Pack Mules. | Pack Bullocks. | Light Carts with Mules. | Army Transport Carts. | Maundage available on the "A. Scale," as per Col. 5. | Maundage available on the "B. Scale," as per Col. 6. |
| Rawul Pindie ... | Rawul Pindie<br>Peshawar<br>Nowshera<br>Attock<br>Campbellpore<br>Talagang<br>Murree Hills<br>Jhelum<br>Sealkote   | <div>4 Mule Cadres<br/>3 Camel Cadres<br/>1 A. T. Cart Cadre<br/>5 Sec. Elephants</div> | 480         | 138     | ...            | 52                    | ...                     | 30         | 2,450                                                                        | 2,724     | 480                                                                             | ...       | 52       | 1,400       | 1,684          |                         |                       | Including also those with the equipped forces, the total Pack Mules in this Circle for peace duties exceed Col. Low's by 92 Mules. |
| Lahore ...       | Meeran Meer<br>Unrisaur<br>Ferozepore<br>Mooltan<br>Jullundur<br>Dhurnsala<br>Bukloh                               | <div>2 A. T. Cart Cadres<br/>5 Sec. Elephants</div>                                     | ...         | ...     | ...            | 103                   | ...                     | 30         | 1,650                                                                        | 1,686     | ...                                                                             | ...       | 103      | 1,200       | 1,236          |                         |                       | Including Camels with equipped forces there are only 14 short of Col. Low's; against this 61 A. T. Carts are allotted in excess.   |

[illegible]



\* It may perhaps be necessary to give Secunderabad another Camel Cadre to meet peace requirements.

| Station        | Camel Cadres*      |                |                    |                | Elephant sections, equal to 54 Elephants. |                |                    |                | Total Mobile transport available for despatch by rail. |                |                    |                | Total besides these the 8 Mule Subdivisions of the 8 Mixed Troops attached to forces not guarding frontiers are available, together with the Regimental Mules of those forces, in all about 1,600 additional Mules. |                |                    |                |
|----------------|--------------------|----------------|--------------------|----------------|-------------------------------------------|----------------|--------------------|----------------|--------------------------------------------------------|----------------|--------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------|----------------|
|                | 1 A. T. Cart Cadre | 2 Camel Cadres | 1 A. T. Cart Cadre | 2 Camel Cadres | 1 A. T. Cart Cadre                        | 2 Camel Cadres | 1 A. T. Cart Cadre | 2 Camel Cadres | 1 A. T. Cart Cadre                                     | 2 Camel Cadres | 1 A. T. Cart Cadre | 2 Camel Cadres | 1 A. T. Cart Cadre                                                                                                                                                                                                  | 2 Camel Cadres | 1 A. T. Cart Cadre | 2 Camel Cadres |
| Secunderabad   | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Bellary        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Bangalore      | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| French Rocks   | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Cannanore      | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Mercara        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Nilgiris       | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Calicut        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Maliyapuram    | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Mangalore      | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Madras         | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| St. Thomas Mt. | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Vellore        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Vizianagaram   | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Poonamallee    | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Wallait        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Pallavaram     | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Vizianagaram   | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Guntur         | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Chittoor       | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Renbulpore     | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Rayachoti      | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Trichinopoly   | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Palaicotta     | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Kanpore        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Quilon         | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Thayetmyo      | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Toungoo        | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Madras         | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Bangalore      | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |
| Secunderabad   | ...                | ...            | ...                | ...            | ...                                       | ...            | ...                | ...            | ...                                                    | ...            | ...                | ...            | ...                                                                                                                                                                                                                 | ...            | ...                | ...            |

Note.—There being with this scheme an excess of Pack Transport with the equipped forces, it would be desirable to substitute Mule Carts for some of that in Circles, so as to have some of these in the second line. If, therefore, the peace requirements of Bangalore, Poona and Mhow permit it, it would be best to convert the 6 Mule Cades in those Circles into 6 Mule Cart Cades.

This would leave the respective amounts of transport as below.

|                                    | WITH EQUIPPED FORCES. |         |                |                | WITH DEPOTS OR CIRCLES. |                |                 |       | Total<br>Camels. | Total<br>Mule<br>Carts with<br>Mules. | Total<br>A. T.<br>Carts. | Total<br>Maundage. |
|------------------------------------|-----------------------|---------|----------------|----------------|-------------------------|----------------|-----------------|-------|------------------|---------------------------------------|--------------------------|--------------------|
|                                    | Pack<br>Mules.        | Camels. | Mule<br>Carts. | Pack<br>Mules. | Camels.                 | Mule<br>Carts. | A. T.<br>Carts. |       |                  |                                       |                          |                    |
|                                    |                       |         |                |                |                         |                |                 |       |                  |                                       |                          |                    |
| (a.) In present scheme             | 6,669                 | 2,462   | Nil.           | 1,925          | 552                     | 72             | 1,033           | 8,594 | 3,014            | 72                                    | 1,033                    | 45,088 mds.        |
| (b.) Proposed alterations as above | 6,669                 | 2,462   | Nil.           | 1,205          | 552                     | 288            | 1,033           | 7,874 | 3,014            | 288                                   | 1,033                    | 44,943 "           |
| (c.) Colonel Low's scheme          | 5,618                 | 2,025   | 423            | 2,000          | 920                     | 50             | 900             | 7,618 | 2,945            | 473                                   | 900                      | 43,599 "           |

If this alteration (which would not reduce the carrying capacity) were carried out, it would reduce the cost of the scheme to Rs. 26,50,587.

TABLE C.

Showing Grand Total of Transport Troops and Cadres throughout India. (As per Tables A. and B.)

| FORCE OR CIRCLE.                                        | Regimental Mules. | Mule Troops (full). | Mule Troops (reduced). | Camel Troops (full). | Camel Troops (reduced). | Mixed Troops (full). | Mixed Troops (reduced). | Hazara Transport Troop. | Kohat Transport Troop. | Dera Ismail Khan Troop. | Dera Ghazi Khan Troop. | Assam Elephant Troop. | Burmese Elephant Troop. | Oude Elephant Troop. | Assam Coolie Corps. | Mule Cadres. | Camel Cadres. | Army Transport Cart Cadres. | Light Cart Cadres. | Pack Bullock Cadres. | Elephant Sections. | Boats. | OFFICERS. |              | REMARKS.                                                                |
|---------------------------------------------------------|-------------------|---------------------|------------------------|----------------------|-------------------------|----------------------|-------------------------|-------------------------|------------------------|-------------------------|------------------------|-----------------------|-------------------------|----------------------|---------------------|--------------|---------------|-----------------------------|--------------------|----------------------|--------------------|--------|-----------|--------------|-------------------------------------------------------------------------|
|                                                         |                   |                     |                        |                      |                         |                      |                         |                         |                        |                         |                        |                       |                         |                      |                     |              |               |                             |                    |                      |                    |        | Captains. | Lieutenants. |                                                                         |
| Peshawar Force                                          | 144               | ..                  | ..                     | 1                    | ..                      | ..                   | 2                       | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 2            | (a). The P. F. Mixed Troops have all Government Camels.                 |
| 1st Punjab Brigade                                      | 108               | ..                  | ..                     | ..                   | ..                      | 1                    | 1                       | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 1            | (b). The Burmese Elephant Troop has 9 Subdivisions of unequal strength. |
| 2nd " "                                                 | 108               | ..                  | ..                     | ..                   | ..                      | 1                    | 1                       | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 1            | (c). The Assam Elephant Troop has 7 Subdivisions of equal strength.     |
| 3rd " "                                                 | 108               | ..                  | ..                     | ..                   | ..                      | 1                    | 1                       | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 1            |                                                                         |
| Sinde Force                                             | 72                | ..                  | ..                     | ..                   | 1                       | ..                   | 1                       | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 4            |                                                                         |
| Rohilkand Force                                         | 96                | ..                  | ..                     | ..                   | 1                       | ..                   | ..                      | ..                      | 1(a)                   | 1(a)                    | 1(a)                   | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 2            |                                                                         |
| Punjab Frontier Force                                   | 288               | ..                  | ..                     | ..                   | ..                      | ..                   | ..                      | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 2            |                                                                         |
| Burmese Force                                           | 204               | ..                  | 2                      | ..                   | ..                      | ..                   | ..                      | ..                      | ..                     | ..                      | ..                     | ..                    | 1(b)                    | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 2            |                                                                         |
| Quetta Force                                            | 144               | ..                  | 3                      | ..                   | ..                      | ..                   | ..                      | ..                      | ..                     | ..                      | ..                     | ..                    | ..                      | ..                   | ..                  | ..           | ..            | ..                          | ..                 | ..                   | ..                 | ..     | ..        | 2            |                                                                         |
| Eastern Frontier Force including also the Assam Circle* | 72                | ..                  | 1                      | ..                   | ..                      | ..                   | ..                      | ..                      | ..                     | ..                      | ..                     | 1(c)                  | ..                      | ..                   | 1                   | ..           | ..            | ..                          | ..                 | ..                   | 6                  | ..     | 2         |              | * Of the whole the following form the allotment for the Circle—         |
|                                                         |                   |                     |                        |                      |                         |                      |                         |                         |                        |                         |                        |                       |                         |                      |                     |              |               |                             |                    |                      |                    |        |           |              | Coolie Corps .. 4 Subdivisions.                                         |
|                                                         |                   |                     |                        |                      |                         |                      |                         |                         |                        |                         |                        |                       |                         |                      |                     |              |               |                             |                    |                      |                    |        |           |              | Elephant Troop 3 "                                                      |
|                                                         |                   |                     |                        |                      |                         |                      |                         |                         |                        |                         |                        |                       |                         |                      |                     |              |               |                             |                    |                      |                    |        |           |              | Mule Troop 2 "                                                          |
|                                                         |                   |                     |                        |                      |                         |                      |                         |                         |                        |                         |                        |                       |                         |                      |                     |              |               |                             |                    |                      |                    |        |           |              | 6 Boats.                                                                |
|                                                         | 1,344             | ..                  | 6                      | 1                    | 3                       | 3                    | 5                       | 1                       | 1                      | 1                       | 1                      | 1                     | 1                       | ..                   | 1                   | ..           | ..            | ..                          | ..                 | ..                   | ..                 | 6      | ..        | 17           |                                                                         |

|                     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    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(d) The Once Elephant Troop has 16 Sections, of equal strength. The Officer Commanding it, commands also the Cart Cadre.

(e) The 10 A. T. Cart Cadres in Bengal have 518 Train Bullocks. These in Bombay and Madras, Transport Bullocks.

The total is therefore as follows:—

13 Cadres have 52 Carts.  
7 Cadres have 51 " "  
6 Cadres in Bombay and Madras having 52 Carts require... 110×6 . 660  
4 Cadres in Bombay and Madras having 51 Carts require... 108×4 . 432

Total Bullocks ... 1,092  
(f) Shown above with Eastern Frontier Force.

(g) The Officer Commanding the Burmese Elephant Troop commands these Cadres also (see Table D).

Number of animals, etc., in each.



TABLE D.

Showing distribution of Officers' Commands, in time of peace, showing that none are excessive.

| Force or Circle.                         | Officer's own Command.                           | Attached commands (for peace only.)<br>(c) | TOTAL NUMBER OF ANIMALS, CARTS, ETC.,<br>UNDER EACH OFFICER. |         |            |                |          |              |              |        |
|------------------------------------------|--------------------------------------------------|--------------------------------------------|--------------------------------------------------------------|---------|------------|----------------|----------|--------------|--------------|--------|
|                                          |                                                  |                                            | Mules.                                                       | Camels. | Elephants. | Pack Bullocks. | Coolies. | A. T. Carts. | Light Carts. | Boats. |
| Peshawar Force                           | Lieutenant Commanding 1st Mixed Troop (reduced). | Camel Troop (full)                         | 120                                                          | 372     | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Lieutenant Commanding 2nd Mixed Troop (reduced). | Nil.                                       | 120                                                          | 140     | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Lieut. Commanding Mixed Troop (full) ...         | 1 Mixed Troop (reduced)                    | 240                                                          | 326     | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Ditto ditto ...                                  | 1 Camel Troop "                            | 120                                                          | 372     | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Ditto ditto ...                                  | 1 Mixed Troop "                            | 240                                                          | 326     | ..         | ..             | ..       | ..           | ..           | ..     |
| Sinde Force                              | Lieutenant Commanding Mixed Troop (reduced).     | 1 Camel Troop "                            | 120                                                          | 326     | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Lieutenant Commanding Camel Troop (reduced).     | Nil.                                       | ...                                                          | 186     | ..         | ..             | ..       | ..           | ..           | ..     |
| Rohilkhand Force                         | Lieutenant Commanding 1st Mule Troop (reduced).  | 2nd Mule Troop "                           | 970                                                          | ..      | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Lieutenant Commanding 3rd Mule Troop (reduced).  | Nil.                                       | 435                                                          | ..      | ..         | ..             | ..       | ..           | ..           | ..     |
| Quetta Force                             | Lieutenant Commanding Hazara Troop ...           | Nil.                                       | 605                                                          | 46      | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Lieutenant Commanding Kohat Troop ...            | Nil.                                       | 365                                                          | 138     | ..         | ..             | ..       | ..           | ..           | ..     |
| P. F. Force                              | Lieutenant Commanding D. Ismail Troop (a).       | Nil.                                       | 435                                                          | 184     | ..         | ..             | ..       | ..           | ..           | ..     |
|                                          | Lieutenant Commanding D. Ghazi Troop (a).        | Nil.                                       | 245                                                          | 46      | ..         | ..             | ..       | ..           | ..           | ..     |
| Burmese Force and Rangoon Circle.        | Lieutenant Commanding Burmese Elephant Troop.    | (b) 2 Pack Bullock Cadres                  | ...                                                          | ...     | 107        | 432            | ..       | ..           | 72           | ..     |
|                                          | Lieutenant Commanding 1st Mule Troop (reduced).  | 2 Light Cart Cadres                        | 970                                                          | ..      | ..         | ..             | ..       | ..           | ..           | ..     |
| Eastern Frontier Force and Assam Circle. | Lieutenant Commanding Assam Elephant Troop.      | (b) Coolie Corps                           | ...                                                          | ...     | 85         | ...            | 1,224    | ..           | ..           | ..     |
|                                          | Lieutenant Commanding Mule Troop (reduced).      | (b) Assam boats                            | 435                                                          | ...     | ...        | ...            | ...      | ...          | ...          | 6      |

(a) The disparity in the size of the commands of the Dera Ismail and Dera Ghazi Troops seems preferable to equalizing them, and stationing part of the latter at Dera Ismail.

The Troop could if necessary split into two Troops.

(b) The General Officers concerned would of course have liberty to make such alteration in these cases as they might find convenient, regarding the attached commands.

(c) The moment an attached Troop has to proceed on service an officer to be appointed to the separate command of it; this need not cause a day's delay, if the officer in question be nominated by the General Officer Commanding beforehand, from among the Garrison.

It might possibly be desirable to have no attached commands in any of the forces guarding frontiers; if so, this would merely entail three additional Lieutenants.

TABLE D.—(Continued.)

Showing distribution of Officers' Commands, in time of peace, showing that none are excessive.

| FORCE OR CIRCLE.                                                                 | Officer's own Command.                     | Attached commands (for peace only).<br>(c)                                          | TOTAL NUMBER OF ANIMALS, CARTS, ETC.,<br>UNDER EACH OFFICER. |         |            |                |          |                                        |
|----------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------|------------|----------------|----------|----------------------------------------|
|                                                                                  |                                            |                                                                                     | Mules.                                                       | Camels. | Elephants. | Pack Bullocks. | Coolies. | A. T. Carts.<br>Light Carts.<br>Boats. |
| Rawal Pindies Circle                                                             | Captain Commanding A. T. Cart Cadre ..     | {<br>4 Mule Cadres<br>3 Camel Cadres<br>5 Elephant Sections<br>2nd A. T. Cart Cadre | 480                                                          | 138     | 30         | ..             | ..       | 52                                     |
| Lahore Circle                                                                    | Captain Commanding ditto ..                | {<br>5 Elephant Sections<br>2nd A. T. Cart Cadre                                    | ..                                                           | ..      | 30         | ..             | ..       | 103                                    |
| Meerut Circle                                                                    | Captain Commanding ditto ditto ..          | {<br>4 Mule Cadres<br>2 Camel Cadres<br>4 Elephant Sections<br>2nd A. T. Cart Cadre | 480                                                          | 92      | 24         | ..             | ..       | 52                                     |
| Seepree Circle                                                                   | Captain Commanding ditto ditto ..          | {<br>4 Elephant Sections<br>2nd A. T. Cart Cadre                                    | ..                                                           | ..      | 30         | ..             | ..       | 103                                    |
| Lucknow Circle                                                                   | Lieutenant Commanding Oudh Elephant Troop. | {<br>6 Elephant Sections<br>4. T. Cart Cadre                                        | ..                                                           | ..      | 97         | ..             | ..       | 52                                     |
| Allahabad Circle                                                                 | Captain Commanding A. T. Cart Cadre ..     | {<br>2nd A. T. Cart Cadre<br>1 Pack Bullock Cadre                                   | ..                                                           | ..      | 30         | 216            | ..       | 103                                    |
| Calcutta Circle                                                                  | Ditto ditto ditto ..                       | {<br>5 Elephant Sections<br>9 Camel Cadres and Elephants                            | ..                                                           | 230     | 54         | ..             | ..       | 52                                     |
| Jacobabad Circle                                                                 | Ditto ditto ditto ..                       | {<br>2nd A. T. Cart Cadre                                                           | ..                                                           | ..      | 60         | ..             | ..       | 52                                     |
| Mhow Circle                                                                      | Ditto ditto ditto ..                       | {<br>2 Mule Cadres and Elephants<br>Ditto                                           | 240                                                          | ..      | ..         | ..             | ..       | 103                                    |
| Poona Circle                                                                     | Ditto ditto ditto ..                       | {<br>2 Camel Cadres<br>2nd A. T. Cart Cadre                                         | 240                                                          | 92      | ..         | ..             | ..       | 103                                    |
| Secunderabad Circle                                                              | Ditto ditto ditto ..                       | {<br>2 Mule Cadres<br>2nd A. T. Cart Cadre                                          | ..                                                           | ..      | 54         | ..             | ..       | 52                                     |
| Bangalore Circle                                                                 | Ditto ditto ditto ..                       | {<br>2nd A. T. Cart Cadre<br>1 Pack Bullock Cadre                                   | 240                                                          | ..      | ..         | ..             | ..       | 103                                    |
| Madras Circle                                                                    | Ditto ditto ditto ..                       | {<br>Entered above with Burmese Force.                                              | ..                                                           | ..      | 216        | ..             | ..       | 103                                    |
| Langoon Circle                                                                   | ..                                         | ..                                                                                  | ..                                                           | ..      | ..         | ..             | ..       | ..                                     |
| TOTAL—                                                                           |                                            |                                                                                     |                                                              |         |            |                |          |                                        |
| 12 Captains with staff pay @ Rs. 250.                                            |                                            |                                                                                     |                                                              |         |            |                |          |                                        |
| 18 Lieutenants with staff pay @ Rs. 150.                                         |                                            |                                                                                     |                                                              |         |            |                |          |                                        |
| 1 Major Assistant Quarter-Master General for Transport with staff pay @ Rs. 800. |                                            |                                                                                     |                                                              |         |            |                |          |                                        |

TABLE E.

Showing Total Transport maintained in peace in each province and throughout India.

| PROVINCE<br>OR<br>ARMY CORPS<br>AREA. | DETAILS AS PER<br>TABLES<br>A. AND B.                         | Officers. | Mules.    | Government Camels. | Hired Camels. | Pack Bullocks. | Draught Bullocks. | Army Transport<br>Carts. | Light Carts. | Elephants. | Birds. | Mates.  | Coolies. | Boats. | EQUIVALENT IN<br>MAUNDS. |                       | REMARKS.                                              |
|---------------------------------------|---------------------------------------------------------------|-----------|-----------|--------------------|---------------|----------------|-------------------|--------------------------|--------------|------------|--------|---------|----------|--------|--------------------------|-----------------------|-------------------------------------------------------|
|                                       |                                                               |           |           |                    |               |                |                   |                          |              |            |        |         |          |        | On the<br>"A. Scale"     | On the<br>"B. Scale." |                                                       |
| Punjab Army                           | Punjab Frontier<br>Force.                                     | 10,377 6  | 414 16 74 | ...                | ...           | ...            | ...               | (b). 155                 | ...          | 60         | ...    | ...     | ...      | ...    | 18,212                   | 20,752                | (b). Are equip-<br>ped with siege train<br>bullocks.  |
|                                       | Peshawar Force ...<br>3 Punjab Brigades<br>Punjab Circles ... |           |           |                    |               |                |                   | ...                      | ...          | ...        | ...    | ...     | ...      | ...    | ...                      | ...                   |                                                       |
| Bengal Army                           | Eastern Frontier<br>Force.                                    | 8,113 3   | 278       | ...                | 218           | ...            | ...               | (b). 362                 | ...          | 320        | 18     | 36 1224 | ...      | 6      | 13,448                   | 14,178                |                                                       |
|                                       | Rohilkund Force<br>Bengal Circles ...                         |           |           |                    |               |                |                   | ...                      | ...          | ...        | ...    | ...     | ...      | ...    | ...                      | ...                   |                                                       |
| Bombay Army                           | Quetta Force ...                                              | 6,215 1   | 556       | ...                | ...           | 546            | 258               | ...                      | ...          | 60         | ...    | ...     | ...      | ...    | 10,132                   | 11,338                | Draught bullocks<br>not included.                     |
|                                       | Sinde Force ...<br>Bombay Circles ...                         |           |           |                    |               |                |                   | ...                      | ...          | ...        | ...    | ...     | ...      | ...    | (a). 10,008              | (a). 10,779           |                                                       |
| Madras Army                           | Burmese Force ...                                             | 6,160 6   | 92        | ...                | 654           | 546            | 258               | ...                      | 72           | 161        | ...    | ...     | ...      | ...    | ...                      | ...                   | (a). 72 draught<br>Mules not included<br>in maundage. |
|                                       | Madras Circles ...                                            |           |           |                    |               |                |                   | ...                      | ...          | ...        | ...    | ...     | ...      | ...    | ...                      | ...                   |                                                       |
|                                       | Ast. Qr. Mr. Genl.<br>for Transport ...                       | 1         | ...       | ...                | ...           | ...            | ...               | ...                      | ...          | ...        | ...    | ...     | ...      | ...    | ...                      | ...                   | Draught bullock<br>and Mules not in-<br>cluded.       |
|                                       | Total for India ...                                           |           |           |                    |               |                |                   | ...                      | 72           | 601        | 18     | 36 1224 | ...      | 6      | Mds. 51,600              | Mds. 56,787           |                                                       |

**TABLE F.**  
Showing main details of each Class of Troop.

| Description of Troop.         | No. of Sections in a S. D. | No. of S. D. in a troop. | Establishment of a Section. | Establishment of a S. D. (including a cadre). | Establishment of the troop, including the Head-Quarters. | REMARKS.                                              |
|-------------------------------|----------------------------|--------------------------|-----------------------------|-----------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
| Mule Troop (full) ...         | 4                          | 5                        | 30 Mules do.                | 120 Mules do.                                 | 605 Mules                                                | (a) Two of the sections have 12 Camels and 3 only 11. |
| Do. (reduced)                 | 4                          | 4                        | 12 Camels                   | 48 Camels (a)                                 | 485 Mules                                                |                                                       |
| Camel Troop (full) ...        | 4(a)                       | 5                        |                             |                                               | 293 Camels                                               |                                                       |
| Do. (reduced)                 | 4                          | 4                        | do.                         | do.                                           | 186 do.                                                  | { (b) 1 Mule S. D. and 4 Camel S. D.                  |
| Mixed Troop (full)            | 4                          | 5(b)                     | { 30 Mules or 12 Camels }   | { 120 Mules or 48 Camels }                    | { 120 Mules and 186 Camels }                             |                                                       |
| Do. (reduced)                 | 4                          | 4(c)                     | do.                         | do.                                           | { 120 Mules and 140 Camels }                             | { (c) 1 Mule S. D. and 3 Camel S. D.                  |
| Hasara Troop                  | 4                          | 6(d)                     | do.                         | do.                                           | { 605 Mules and 48 Camels }                              | { (d) 5 Mule S. D.                                    |
| Kohat Troop                   | 4                          | 6(e)                     | do.                         | do.                                           | { 365 Mules and 138 Camels }                             | { (e) 1 Camel S. D. 3 Mule S. D.                      |
| Dera Ismail Troop             | 4                          | 8(f)                     | do.                         | do.                                           | { 485 Mules and 184 Camels }                             | { (f) 3 Camel S. D. 4 Mule S. D.                      |
| Dera Ghazi Troop              | 4                          | 3(g)                     | do.                         | do.                                           | { 245 Mules and 48 Camels }                              | { (g) 4 Camel S. D. 2 Mule S. D.                      |
| E-A. Troop                    | 4                          | 7                        | 3 Elephants                 | 12 Elephants or 18 Elephants                  | 85 Elephants                                             | { 1 Camel S. D.                                       |
| E-B. Troop                    | none                       | 9(h)                     | .....                       | { 15 do. or 8 do. }                           | 107 do.                                                  | { (h) Of unequal strength.                            |
| E-O. Troop                    | 16                         | none                     | 6 Elephants                 | 12 do.                                        | 97 do.                                                   | (k) Cadre, 53 Carts.                                  |
| Assam Coolie Corps            | 3                          | 18                       | 34 Coolies                  | .....                                         | 1,224 Coolies                                            |                                                       |
| (w) Army Transport Cart Troop | 5                          | 5                        | 17 A. T. Carts              | 68 Coolies                                    | 256 A. T. Carts                                          |                                                       |
| (x) Light Cart Troop          | 3                          | 5                        | 9 Lt. Carts                 | 51 A. T. Carts (k)                            | 182 Lt. Carts                                            |                                                       |
| (z) Country Cart Troop        | 3                          | 5                        | 10 Carts                    | 36 Lt. Carts                                  | 150 Carts                                                |                                                       |
| (y) Pack Bullock Troop        | 4                          | 5                        | 54 Bullocks                 | 80 Carts                                      | 1,200 Bullocks                                           |                                                       |
| An Elephant Section           | ...                        | ...                      | 6 Elephants                 | 218 Bullocks                                  | .....                                                    |                                                       |

Of (w), (x), and (y) only the Cadre Subdivisions are kept up in peace.

Of (z) no Cadres are kept up, all being disembodied troops.

The establishment of Regimental Mules is 6 per Company equipped; and for Sappers 12 per Company equipped.

**TABLE G.**  
*Cost of the Scheme.*

| References.   | DETAIL.                                                                                                                 | Annual Cost.<br>of<br>each.* | TOTAL<br>Annual Cost. |
|---------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------|
|               |                                                                                                                         | Rs. A. P.                    | Rs.                   |
| Table C & XV. | 1,344 Regimental Mules ...                                                                                              | 144 8 0                      | 1,94,208              |
| " I.          | 6 Mule Troops (reduced) ...                                                                                             | 71,237 0 0                   | 4,27,422              |
| " II.         | 1 Camel Troop (full) ...                                                                                                | ...                          | 22,903                |
| " II.         | 3 Camel Troops (reduced) ...                                                                                            | 18,450 0 0                   | 55,350                |
| " III.        | 3 Mixed Troops (full) ...                                                                                               | 35,791 0 0                   | 1,07,373              |
| " III.        | 5 Mixed Troops (reduced) ...                                                                                            | 31,339 0 0                   | 1,56,695              |
| " IV.         | Hazara Transport Troop ...                                                                                              | ...                          | 96,545                |
| " V.          | Kohat Transport Troop... ..                                                                                             | ...                          | 77,987                |
| " VI.         | Dera Ismail Transport Troop ...                                                                                         | ...                          | 1,03,295              |
| " VII.        | Dera Ghazi Transport Troop ...                                                                                          | ...                          | 44,279                |
| " VIII.       | Assam Elephant Troop ...                                                                                                | ...                          | 52,200                |
| " IX.         | Burmese Elephant Troop ...                                                                                              | ...                          | 65,160                |
| " X.          | Oudh Elephant Troop... ..                                                                                               | ...                          | 60,120                |
| " XI.         | Assam Coolie Corps ...                                                                                                  | ...                          | 1,25,328              |
| " I.          | Assam Boats ...                                                                                                         | ...                          | 3,636                 |
| " I.          | 14 Mule Cadres ...                                                                                                      | 17,581 0 0                   | 2,46,134              |
| " II.         | 12 Camel Cadres ...                                                                                                     | 4,813 0 0                    | 57,756                |
| " XII.        | (In Bengal) 7 A. T. Cart Cadres, with<br>Siege Bullocks, and with Head<br>Quarter Establishments ...                    | 7,287 0 0                    | 51,009                |
| " "           | Ditto 3 ditto without Head Quarter<br>Establishments ...                                                                | 6,252 0 0                    | 18,756                |
| " "           | (In Bombay and Madras) 6 A. T. Cart<br>Cadres, with Transport Bul-<br>locks and with Head Quarter<br>Establishments ... | 20,668 0 0                   | 1,24,008              |
| " "           | Ditto 4 ditto without Head Quarter<br>Establishments ...                                                                | 19,377 0 0                   | 77,508                |
| " XIII.       | 2 Light Cart Cadres ...                                                                                                 | 9,799 0 0                    | 19,598                |
| " XIV.        | 4 Pack Bullock Cadres ...                                                                                               | 28,600 0 0                   | 1,14,400              |
| " XVI.        | 52 Elephant Sections ...                                                                                                | 3,600 0 0                    | 1,87,200              |
| Table D.      | 18 Lieutenants, with Staff Pay @ 150... ..                                                                              | 4,500 0 0                    | 81,000                |
|               | 12 Captains, with Staff Pay @ 250 ...                                                                                   | 7,488 0 0                    | 89,856                |
|               | 1 Staff Officer of Transport (Major)<br>Staff @ 800 ...                                                                 | ...                          | 17,292                |
|               | Office allowance for ditto @ 200 ...                                                                                    | ...                          | 2,400                 |
|               | Pensions calculated for 6,000 followers ...                                                                             | ...                          | 18,000                |
|               | TOTAL ...                                                                                                               | ...                          | 26,97,418             |

- (a) If Mule Carts were substituted for part of the excess in Pack Mules, as noted at foot of Table B (without reducing the carrying capacity) the cost would be reduced to Rs. 26,50,587
- (b) If it were desired to reduce the carrying capacity to the limits of Col. Low's scheme only, but still retaining this organization, the cost could be reduced to ... Rs. 24,38,000

\* The cost of the officers is shown separately from their Troops.\*

† In the complete scheme full details of the cost of each Troop and Cadre are contained in Table Nos. XXIV to XLV.

TABLE H.

*Showing amount of transport (in Maunds) required by the different Corps on the "half scale" after making the necessary deductions for Regimental Mules allotted to Infantry and Sappers.*

| Corps.                     | Maundage on the cold weather service scale. | Maundage on the half scale. | Equivalent of water mules allotted. | Total required on half scale. | Equivalent of Regimental Mules allotted separately (to be deducted.) | Balance required. | REMARKS.                                                                     |
|----------------------------|---------------------------------------------|-----------------------------|-------------------------------------|-------------------------------|----------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------|
|                            | Mds.                                        | Mds.                        | Mds.                                | Mds.                          | Mds.                                                                 | Mds.              |                                                                              |
| Sapper Company             | 136                                         | 68                          | 4                                   | 72                            | 24                                                                   | 48                |                                                                              |
| Field Battery              | 300                                         | 150                         | .....                               | 150                           | .....                                                                | 150               |                                                                              |
| Mountain Battery (British) | 312                                         | 156                         | .....                               | 156                           | .....                                                                | 156               |                                                                              |
| Ditto (Native)             | 200                                         | 100                         | .....                               | 100                           | .....                                                                | 100               |                                                                              |
| Native Cavalry             | 300                                         | 150                         | .....                               | 150                           | .....                                                                | 150               | (a) Estimated for an average strength on service of 34 officers and 750 men. |
| British Infantry           | 1,064 (a)                                   | 532                         | 16                                  | 548                           | 48                                                                   | 500               | (b) Estimated for an average strength on service of 8 officers and 720 men.  |
| Native Infantry            | 664 (b)                                     | 332                         | 16                                  | 348                           | 48                                                                   | 300               | (But see para. 49, Sec. IV.)                                                 |

*N.B.*—No Transport Establishments are included in the above. With the present scheme it is of small importance whether this estimate is correct or not, as the total maundage provided by each troop on either the "A" or "B" scale is shown in the tables, and the amount allotted to each equipped Force is ample.

TABLE K.

*Showing Equipment necessary to complete Mule and Army Transport Cart Cadres to their war strength, provided such equipment is kept ready.*

| PROVINCE.            | Number of Mule and A. T. Cart Cadres in each province. | Number of carts or saddles to complete each Cadre. |               | TOTAL.       |               |              | Arsenal in which they would have to be kept up. |
|----------------------|--------------------------------------------------------|----------------------------------------------------|---------------|--------------|---------------|--------------|-------------------------------------------------|
|                      |                                                        | A. T. Carts.                                       | Mule Saddles. | A. T. Carts. | Mule Saddles. | Light Carts. |                                                 |
| PUNJAB               | { ...<br>3 A. T. Cart Cadres<br>4 Mule Cadres          | ...                                                | 204           | 485          | 612           | 1,940        | Ferozepore Arsenal.                             |
| BENGAL               | { ...<br>7 A. T. Cart Cadres<br>4 Mule Cadres          | ..                                                 | 204           | 485          | 1,428         | 1,940        | { Allahabad do.<br>Fort William do.             |
| BOMBAY               | { ...<br>5 A. T. Cart Cadres<br>4 Mule Cadres          | ...                                                | 204           | 485          | 1,020         | 1,940        | Bombay Arsenal.                                 |
| MADRAS               | { ...<br>5 A. T. Cart Cadres<br>2 Mule Cadres          | ...                                                | 204           | 485          | 1,020         | 970          | Madras do.                                      |
| FOR RANGOON ONLY     | 2 Light Cart Cadres at 146 each                        | ...                                                | .....         | .....        | .....         | 292          | Do. do.                                         |
| TOTALS FOR ALL INDIA |                                                        | ...                                                | ...           | 4,080        | 7,082         | 292          |                                                 |

TABLE L.

*Showing the Disembodied Transport required from Bengal, Bombay, and Madras to complete from Peace to War Strength.*

| Province.                         | DETAIL.<br>(Table C, and paras. 108 and 116).                                 | NO. OF ANIMALS OR CARTS REQUIRED<br>TO COMPLETE EACH. |              |                |              |                                  |                                    | EQUIVALENT IN<br>MAUNDS. |              |
|-----------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------|--------------|----------------|--------------|----------------------------------|------------------------------------|--------------------------|--------------|
|                                   |                                                                               | Mules.                                                | Camels.      | Pack Bullocks. | A. T. Carts. | Draught Bullocks for A. T. Carts | Country Carts with their Bullocks. | On A. Scale.             | On B. Scale. |
| BENGAL.<br>to provide 30,000 mds. | To complete 4 Mule Cadres ...                                                 | 1,940                                                 | ...          | ...            | ...          | ...                              | ...                                | 3,200                    | 3,880        |
|                                   | " 2 Camel Cadres ...                                                          | ...                                                   | 372          | ...            | ...          | ...                              | ...                                | 1,600                    | 1,860        |
|                                   | " 7 A. T. Cart Cadres ...                                                     | ...                                                   | ...          | ...            | 1,428        | 3,234                            | ...                                | 16,800                   | 17,138       |
|                                   | " 1 Pack Bullock Cadre ...                                                    | ...                                                   | ...          | 984            | ...          | ...                              | ...                                | 1,600                    | 1,968        |
|                                   | Total to complete the Cadres in the Bengal Circles ...                        | 1,940                                                 | 372          | 984            | 1,428        | 3,234                            | ...                                | 23,200                   | 24,844       |
|                                   | Additional disembodied troops required:<br>2 Country Cart Troops ...          | ...                                                   | ...          | ...            | ...          | ...                              | 300                                | 6,000                    | 6,000        |
|                                   | 1 Camel Troop ...                                                             | ...                                                   | 232          | ...            | ...          | ...                              | ...                                | 1,000                    | 1,160        |
|                                   | Total from the Bengal Districts ...                                           | 1,940                                                 | 604          | 984            | 1,428        | 3,234                            | 300                                | 30,200                   | 32,004       |
| BOMBAY<br>to provide 24,000 mds.  | To complete 4 Mule Cadres ...                                                 | 1,940                                                 | ...          | ...            | ...          | ...                              | ...                                | 3,200                    | 3,880        |
|                                   | " 5 Camel Cadres ...                                                          | ...                                                   | 930          | ...            | ...          | ...                              | ...                                | 4,000                    | 4,650        |
|                                   | " 5 A. T. Cart Cadres ...                                                     | ...                                                   | ...          | ...            | 1,020        | 2,310                            | ...                                | 12,000                   | 12,240       |
|                                   | Total to complete Bombay Cadres ...                                           | 1,940                                                 | 930          | ...            | 1,020        | 2,310                            | ...                                | 19,200                   | 20,770       |
|                                   | Additional disembodied troops:<br>1 Mule Troop ...                            | 605                                                   | ...          | ...            | ...          | ...                              | ...                                | 1,000                    | 1,210        |
|                                   | 1 Camel Troop ...                                                             | ...                                                   | 232          | ...            | ...          | ...                              | ...                                | 1,000                    | 1,160        |
|                                   | 1 Cart Troop ...                                                              | ...                                                   | ...          | ...            | ...          | ...                              | 150                                | 3,000                    | 3,000        |
|                                   | Total from the Bombay Districts ...                                           | 2,545                                                 | 1,162        | ...            | 1,020        | 2,310                            | 150                                | 24,200                   | 26,140       |
| MADRAS<br>to provide 16,000 mds.  | To complete 2 Mule Cadres ...                                                 | 970                                                   | ...          | ...            | ...          | ...                              | ...                                | 1,600                    | 1,940        |
|                                   | " 2 Camel Cadres ...                                                          | ...                                                   | 372          | ...            | ...          | ...                              | ...                                | 1,600                    | 1,860        |
|                                   | " 5 A. T. Cart Cadres ...                                                     | ...                                                   | ...          | ...            | 1,020        | 2,310                            | ...                                | 12,000                   | 12,240       |
|                                   | " 1 Pack Bullock Cadre ...                                                    | ...                                                   | ...          | 984            | ...          | ...                              | ...                                | 1,600                    | 1,968        |
|                                   | Total to complete the Madras Cadres ...<br>(Col. 9 shows this is sufficient). | 970                                                   | 372          | 984            | 1,020        | 2,310                            | ...                                | 16,800                   | 18,008       |
| RANGOON<br>Circle only.           |                                                                               | Drgt.                                                 | Light Carts. |                |              |                                  |                                    |                          |              |
|                                   | To complete 2 Pack Bullock Cadres ...                                         | ...                                                   | ...          | 1,968          | ...          | ...                              | ...                                | 3,200                    | 3,936        |
|                                   | " 2 Light Cart Cadres ...                                                     | 324                                                   | 292          | ...            | ...          | ...                              | ...                                | 1,600                    | 1,723        |
|                                   | Total to complete Rangoon Cadres ...                                          | 324                                                   | 292          | 1,968          | ...          | ...                              | ...                                | 4,800                    | 5,664        |
|                                   | Balance to be made up from mobile portion of that drawn from Madras ...       | ...                                                   | ...          | ...            | ...          | ...                              | ...                                | 10,200                   | ...          |

As regards Madras, it will be seen that the completion of the cadres leaves no deficiency to be made up by additional disembodied troops: as regards Rangoon the deficiency is supplied by the mobile portion of the Madras detail.

The requirements from the Punjab are shown in para. 111, Sec. IX.



# MULE TROOP (Full.)

N.B.

5 "Units" = 1 Section.  
4 Sections = 1 Subdivision.

5 Mule Subdivisions ... 600 mules.  
Head Quarters of Troop ... 5 "

605 Mules.

No. I.  
{ For cost, see Col. 3  
of Table G.

| UNIT.                                                                    | SECTION.                                                                                                                                                                                                                                       | SUBDIVISION.                                                                                                                                                                                                                                                                | TROOP.                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Carrying<br>10 Mounds.                                                   | Carries on the "A scale"<br>" " " " 50 Mounds.<br>" " " " 60 "                                                                                                                                                                                 | Carries on the "A scale"<br>" " " " 300 Mounds.<br>" " " " 240 "                                                                                                                                                                                                            | Carries on the "A scale"<br>" " " " 1,000 Mounds.<br>" " " " 1,210 "                                                                                                                                   |
| 2 Drivers.<br>6 Mules.                                                   | 1 Duffadar.<br>11 Drivers (including 1 spare).<br>30 Mules.                                                                                                                                                                                    | 1 Jemadar, 1st Class.<br>4 Duffadars.<br>44 Drivers.<br>1 Saddler.<br>120 Mules.                                                                                                                                                                                            | 1 Lieutenant.<br>5 Jemadars, 1st Class.<br>20 Duffadars.<br>222 Drivers.<br>5 Saddlers.<br>1 Salutri.<br>1 Assistant Salutri.<br>1 Farrier.<br>1 Writer.                                               |
| 5 loaded, and<br>the 6th carry-<br>ing 20 seers bag-<br>gage of drivers. | <p>DETAIL OF MULES.</p> <p>Carrying 50 mounds stores, etc. ... 25</p> <p>Carrying baggage of detachment,<br/>viz. :—</p> <p>12 men @ 10 seers each = 3 mds. }<br/>1 Mount. Battery tent, 1 md. }<br/>Spare mules ... 3</p> <p>Total ... 30</p> | <p>DETAIL OF MULES.</p> <p>Carrying 200 mounds stores, etc. ... 100</p> <p>Carrying baggage of detachment,<br/>including 4 tents, jemadar }<br/>2 mds. }<br/>Spare mules ... 11</p> <p>Total ... 120</p> <p>Note.—A Cadre Subdivision is the same with a Moonshi added.</p> | <p>DETAIL OF MULES.</p> <p>120 x 5 = 600 mules</p> <p>Comdg. Officer 2 mules }<br/>Medicines 1 " }<br/>Salutri and 1 " }<br/>Farrier 1 " }<br/>Writer &amp; Officer 1 "</p> <p>Total ... 605 mules</p> |

\* A MULE TROOP (REDUCED) has one complete Subdivision less, making therefore

a total of {  
4 Jemadars.  
16 Duffadars.  
178 Drivers.  
4 Saddlers.  
1 Lieutenant.  
1 Salutri.  
1 Assistant Salutri.  
1 Farrier.  
1 Writer.

} with 485 Mules, carrying {  
On the "A scale" 800 mounds.  
On the "B scale" 970 "

## CAMEL TROOP (Full.)

N.B. 4 Units = 1 Section. 5 Camel Subdivisions 230 Camels } 322 Camels { For Cost, see Col. 3  
 4 Sections = 1 Subdivision. Head Quarters of Troop 2 " } of Table G. No. II.

| UNIT.                                                                                                                                                                                                     | SECTION.                                                                                              | SUBDIVISION.                                                                                                                               | TROOP.*                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Carries, 10 Maunds<br>(or 15 Maunds)                                                                                                                                                                      | Carries on the "A scale" ... 50 Maunds.<br>" " " " ... 60 "                                           | Carries on the "A scale" ... 200 Maunds.<br>" " " " ... 230 "                                                                              | Carries on the "A scale" ... 1,000 Maunds.<br>" " " " ... 1,180 "                                            |
| 1 Driver.<br>3 Camels.                                                                                                                                                                                    | 1 Duffadar.<br>4 Drivers } Hired (except in P. F.<br>12 Camels } Force Troops, Tables IV.<br>to VII.) | 1 Jemadar, 2nd Class.<br>4 Duffadars.<br>16 Drivers } Hired (except in P. F.<br>46 Camels } Force Troops, IV. to VII.)                     | 1 Lieutenant.<br>5 Jemadars, 2nd Class.<br>20 Duffadars.<br>1 Writer.<br>80 Drivers } Hired.<br>232 Camels } |
| DETAIL OF CAMELS.                                                                                                                                                                                         |                                                                                                       | DETAIL OF CAMELS.                                                                                                                          |                                                                                                              |
| Carrying 50 maunds stores, etc. ... 10<br>" baggage of 5 men @ ... 40<br>" 10 seers each = 1 md. 10 str. }<br>" + 1 M. B. Tent = 1 " } 2                                                                  |                                                                                                       | Carrying 200 maunds stores, etc. ... 40<br>" baggage of 20 men @ 10 str. }<br>Jemadar, 2 maunds. }<br>2 Tents, 2 " }<br>Spare Camels ... 4 |                                                                                                              |
| Spare Camel ... 1<br>Total ... 12                                                                                                                                                                         |                                                                                                       | Total ... 46                                                                                                                               |                                                                                                              |
| † Transport is calculated for one tent in the Section, but only two tents per Subdivision are necessary. Therefore in each Subdivision Nos. 1 and 4 Sections have 12 Camels, Nos. 2 and 3 only 11 Camels. |                                                                                                       | Note.—A Cadre Subdivision is the same with a moushi added, and a 1st Class Jemadar instead of a 2nd Class one.                             |                                                                                                              |
| Total ... 232 Camels.                                                                                                                                                                                     |                                                                                                       | Hd. Qrs. { Comdg. Officer 1 } 2<br>of Troop. { Writer & Office 1 } 2<br>Total 232 Camels.                                                  |                                                                                                              |

\* A CAMEL TROOP (BAYOUD) has one complete Subdivision less, making therefore

a total of { 1 Lieutenant  
4 Jemadars. 64 Drivers,  
16 Duffadars. 186 Camels } carrying { On the "A scale" ... 800 Maunds.  
On the "B scale" ... 980 "

**MIXED TROOP (Full.)**

*N. B.*—4 Sections=1 Subdivision.

No. III.

1 Mule Subdivision ... 120 mules.  
 4 Camel " ... 184 camels.  
 Head-quarters of Troop... 2 "

{ 120 mules  
 { 186 camels  
 { For Costs see Col. 3 of Table G.

| UNIT.                | SECTION.<br>Carries on the "A scale," ... 50 mds.<br>" " " "B scale" ... 60 " | SUBDIVISION.<br>Carries on the "A scale," ... 200 mds.<br>" " " "B scale," (as in I and II.) | TROOP.*<br>Carries on the "A scale," ... 1,000 mds.<br>" " " "B scale," ... 1,170 "                                                                                                       |
|----------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As in Nos. I and II. | Mule Sections as in No. I.<br>Camel Sections as in No. II.                    | Mule Subdivision as in No. I.<br>Camel Subdivisions as in No. II.                            | 1 Lieutenant.<br>1 Jemadar, 1st Class.<br>4 Jemadars, 2nd Class.<br>20 Duffadars.<br>44 Mule Drivers.<br>120 Mules.<br>64 Camel Drivers<br>with<br>186 Camels.<br>1 Saddler.<br>1 Writer. |
|                      |                                                                               |                                                                                              | } Hired.                                                                                                                                                                                  |
|                      |                                                                               |                                                                                              | Detail of Mules and Camels as per Nos. I and II.                                                                                                                                          |

\* A MIXED TROOP (REDUCED) has one complete Camel Subdivision less, making

|                                                                                                                                                                        |                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| a total of {<br>1 Jemadar (1st class), 3 Jemadars (2nd class)<br>16 Duffadars,<br>44 Mule drivers, 48 Camel drivers,<br>120 Mules, 140 Camels,<br>1 Saddler, 1 Writer. | carrying {<br>On the "A scale," 800 maunds.<br>On the "B scale," 940 " |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|

**HAZARA TRANSPORT TROOP.***(A Mixed Troop, Government Camels.)*

No. IV.

5 Mule Subdivisions ... 600 Mules  
 1 Camel " ... 46 Camels  
 Head-quarters of Troop ... 5 Mules

} = { 605 mules.  
 }     { 46 camels.

| UNIT.                | SECTION.<br>As in Nos. I and II.                                                           | SUBDIVISION<br>As in Nos. I and II.                                                                                                                | TROOP<br>Carries on "A Scale" 1,800 maunds.<br>" " " " "B Scale" 1,440 "                                                                                                                                                                           |
|----------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As in Nos. I and II. | 20 Mule Sections, as per No. I.<br>4 Camel Sections as per No. II.<br>(Government Camels.) | 5 Mule Subdivisions as per No. I.<br>1 Camel Subdivision as per No. II, with the addition of 1 Saddler and 1 Spare Driver.<br>(Government Camels.) | 1 Lieutenant.<br>5 Jemadars, 1st Class.<br>1 Jemadar, 2nd Class.<br>24 Duffadars.<br>222 Mule Drivers.<br>17 Camel Drivers.<br>6 Saddlers.<br>1 Salutri.<br>1 Assistant Salutri.<br>1 Writer.<br>1 Farrier.<br>605 Mules.<br>46 Government Camels. |
|                      |                                                                                            |                                                                                                                                                    | Detail as per Nos. I and II.                                                                                                                                                                                                                       |

Annual Cost of this Troop—Rs. 96,548 (exclusive of the Officer.)

**KOHAT TRANSPORT TROOP.***(A Mixed Troop, Government Camels.)*

No. V.

3 Mule Subdivisions  
 3 Camel                      } = { 365 mules.  
   Head-quarters of Troop   }   { 138 camels.

| Unit.                   | SECTION.<br>As per Nos. I and II.                                                        | SUBDIVISION.<br>As per Nos I and II.                                                                                                                        | TROOP.<br>Carries on "A scale" 1,200 maunds.<br>" " "B scale" 1,420 "                                                                                                                                                                     |
|-------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As in Nos.<br>I and II. | 12 Mule Sections as in No. I.<br>12 Camel Sections as in No. II.<br>(Government Camels.) | 3 Mule Subdivisions as in No. I.<br>3 Camel Subdivisions as in No. II, but with addition to each of 1 Saddler and 1 additional Driver. (Government Camels.) | 1 Lieutenant.<br>3 Jemadars, 1st Class.<br>3 Jemadars, 2nd Class.<br>24 Duffadars.<br>134 Mule Drivers.<br>51 Camel Drivers.<br>6 Saddlers.<br>1 Salutri.<br>1 Assistant Salutri.<br>1 Farrier.<br>1 Writer.<br>365 Mules.<br>138 Camels. |
|                         |                                                                                          |                                                                                                                                                             | Detail as per Nos. I and II.                                                                                                                                                                                                              |

Annual Cost of this Troop—Rs. 77,987 (exclusive of the Officer.)

## DERA ISMAIL KHAN TRANSPORT TROOP.

(A Mixed Troop, Government Camels.)

|                         |     |     |             |               |
|-------------------------|-----|-----|-------------|---------------|
| 4 Mule Subdivisions     | ... | ... | 480 mules.  | } 485 mules.  |
| 4 Camel do.             | ... | ... | 184 camels. |               |
| Head-quarters of Troops | ... | ... | 5 mules.    | } 184 camels. |

No. VI.

| Units.                   | SERGEANT.<br>As in Nos. I and II.                                                        | SUPERVISOR.<br>As in Nos. I and II.                                                                                                                                  | TROOP.<br>Carries on "A Scale."<br>" " " "B Scale"                                                                                                                                                                                                   |
|--------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As in Nos. I.<br>and II. | 16 Mule Sections as in No. I.<br>16 Camel Sections as in No. II,<br>(Government Camels). | 14 Mule Subdivisions as in No. I.<br>4 Camel Subdivisions as in No. II,<br>but with addition to each of 1<br>Saddler and 1 additional Driver<br>(Government Camels). | 1 Lieutenant.<br>4 Jemadars, 1st class.<br>4 Jemadars, 2nd class.<br>32 Duffadars.<br>178 Mule Drivers.<br>68 Camel Drivers.<br>8 Saddlers.<br>1 Salutri.<br>1 Assistant Salutri.<br>1 Farrier.<br>1 Writer.<br>485 Mules.<br>184 Government Camels. |
|                          |                                                                                          |                                                                                                                                                                      | Details as per Nos. I and II.                                                                                                                                                                                                                        |

Annual cost of this Troop—Rs. 1,03,285 (exclusive of the Officer.)

## DERA GHAZI KHAN TRANSPORT TROOP.

*(A Mixed Troop, Government Camels.)*

|                        |     |     |            |                            |
|------------------------|-----|-----|------------|----------------------------|
| 3 Mule Subdivisions    | ... | ... | 240 mules. | } 245 mules.<br>46 camels. |
| 1 Camel Subdivision    | ... | ... | 46 camels. |                            |
| Head-quarters of Troop | ... | ... | 5 mules.   |                            |

No. VII.

| UNIT.                    | SECTION.<br>As in Nos. I and II.                                                      | SUBDIVISION.<br>As in Nos. I and II.                                                                                                                    | TROOP.<br>Carries on "A Scale" ... 600 maunds.<br>" " " "B Scale" ... 720 "                                                                                                                                               |
|--------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As in Nos. I and II.     | 8 Mule Sections as in No. I.<br>4 Camel Sections as in No. II<br>(Government Camels.) | 2 Mule Subdivisions as in No. I.<br>1 Camel Subdivision as in No. II,<br>with the addition of 1 Saddler<br>and 1 additional Driver (Government Camels). | 1 Lieutenant.<br>2 Jemadars, 1st class.<br>1 Jemadar, 2nd class.<br>12 Duffadars.<br>90 Mule Drivers.<br>17 Camel Drivers.<br>3 Saddlers.<br>1 Salutri.<br>1 Farrier.<br>1 Writer.<br>245 Mules.<br>46 Government Camels. |
| Details as per I and II. |                                                                                       |                                                                                                                                                         |                                                                                                                                                                                                                           |

Annual cost of this Troop—Rs. 44,279, (exclusive of the Officer.)

# ASSAM ELEPHANT TROOP.

7 Subdivisions of 12 Elephants each } = 85 Elephants.  
 Head-quarters of Troop, 1 Elephant }

No. VIII.

| SECTION (when required) carries<br>45 Mds. | SUBDIVISION carries 180 Mds.                                         | TROOP.<br>Carries on "A scale" 1,260 Mds.<br>" " "B scale" 1,275 "                                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 Elephants (with Mahout and Coolie each). | 1 Jemadar, 2nd class.<br>12 Elephants (with Mahout and Coolie each). | 1 Lieutenant.<br>7 Jemadars, 2nd Class.<br>1 Writer.<br>85 Elephants (with Mahout and Coolie to each).<br><br><div>           12 × 7 = 84 Elephants.<br/>           For Baggage of Comdg. }<br/>           Officer, Writer and Office } 1 "<br/>           Total ... 85 Elephants.         </div> |

Annual cost of this Troop—Rs. 52,200 (exclusive of the Officer).



**BURMESE ELEPHANT TROOP.**

2 Subdivisions of 18 Elephants each }  
 2 " of 15 " " }  
 5 " of 8 " " }  
 Head-quarters of Troop, 1 Elephant }  
 = 107 Elephants.

**No. IX.**

| SECTION.                                         | SUBDIVISION (various strengths).       | Troop.<br>Carries on "A scale" 1,590 Mds.<br>" "B scale" 1,605 "                                                                                                                                                                                                                                                                                                                                |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|--------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|---------------|--------|---|------|-------|---|------|--------------------------------------------------|--|--|--|--|-----|--|--|---|----------------------|--|
| Nil.                                             | 2 SUBDIVISIONS—                        |                                                                                                                                                                                                                                                                                                                                                                                                 |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|                                                  | 1 Jemadar, 1st Class.<br>18 Elephants. | 1 Lieutenant.<br>2 Jemadars, 1st Class.<br>2 Jemadars, 2nd Class.<br>5 Duffadars.                                                                                                                                                                                                                                                                                                               |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|                                                  | 2 SUBDIVISIONS—                        | 1 Writer.<br>107 Elephants.                                                                                                                                                                                                                                                                                                                                                                     |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|                                                  | 1 Jemadar, 2nd Class.<br>15 Elephants. | DETAIL.                                                                                                                                                                                                                                                                                                                                                                                         |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|                                                  | 5 SUBDIVISIONS—                        | <table> <tr> <td>2 x 18</td><td>=</td><td>36 Elephants.</td></tr> <tr> <td>2 x 15</td><td>=</td><td>30 "</td></tr> <tr> <td>5 x 8</td><td>=</td><td>40 "</td></tr> <tr> <td colspan="3">For Baggage of Comdg. Officer, Writer and Office</td></tr> <tr> <td></td><td></td><td>1 "</td></tr> <tr> <td></td><td></td><td>—</td></tr> <tr> <td colspan="3">Total 107 Elephants.</td></tr> </table> | 2 x 18 | = | 36 Elephants. | 2 x 15 | = | 30 " | 5 x 8 | = | 40 " | For Baggage of Comdg. Officer, Writer and Office |  |  |  |  | 1 " |  |  | — | Total 107 Elephants. |  |
| 2 x 18                                           | =                                      | 36 Elephants.                                                                                                                                                                                                                                                                                                                                                                                   |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
| 2 x 15                                           | =                                      | 30 "                                                                                                                                                                                                                                                                                                                                                                                            |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
| 5 x 8                                            | =                                      | 40 "                                                                                                                                                                                                                                                                                                                                                                                            |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
| For Baggage of Comdg. Officer, Writer and Office |                                        |                                                                                                                                                                                                                                                                                                                                                                                                 |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|                                                  |                                        | 1 "                                                                                                                                                                                                                                                                                                                                                                                             |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
|                                                  |                                        | —                                                                                                                                                                                                                                                                                                                                                                                               |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |
| Total 107 Elephants.                             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                 |        |   |               |        |   |      |       |   |      |                                                  |  |  |  |  |     |  |  |   |                      |  |

Annual cost of this Troop—Rs. 65,160 (exclusive of the Officer).

# OUDE ELEPHANT TROOP.

16 Sections of Elephants each  
Head-quarters of troop, 1 Elephant } = 97 Elephants.

No. X.

| SERVOX.                                                       | HALF TROOP (EIGHT SECTIONS.)                           | TROOP.                                                                                                                                                             |
|---------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Carries 90 Maunds.                                            | Carries 720 Maunds.                                    | Carries on "A. scale" ... 1,440 Maunds.<br>" " "B. scale" ... 1,455 "                                                                                              |
| 1 Duffadar.<br>6 Elephants.<br>(With Mahout and Coolie each.) | 1 Jemadar, 1st Class.<br>8 Duffadars,<br>48 Elephants. | 1 Lieutenant.<br>2 Jemadars, 1st Class (Commanding Right<br>and Left half troops).<br>16 Duffadars.<br>1 Writer.<br>97 Elephants (with Mahout and Coolie to each). |
|                                                               |                                                        | DETAILS.                                                                                                                                                           |
|                                                               |                                                        | 16 x 6 = 96 Elephants.<br>For Baggage of Comdg. Officer, } 1 "<br>Writer and Office. }                                                                             |
|                                                               |                                                        | Total ... 97 Elephants.                                                                                                                                            |

Annual cost of this Troop—Rs. 60,120 (exclusive of the Officer.)

# ASSAM COOLIE CORPS.

18 Subdivisions of two Sections each.

No. XI.

| SERVOX.                | SUBDIVISION.                         | CORPS.                                                                    |
|------------------------|--------------------------------------|---------------------------------------------------------------------------|
| Carries 17 Maunds.     | Carries 34 Maunds.                   | Carries 612 Maunds.                                                       |
| 1 Mate.<br>34 Coolies. | 1 Sirdar.<br>2 Mates.<br>68 Coolies. | 1 Lieutenant.*<br>18 Sirdars.<br>86 Mates.<br>1,224 Coolies.<br>1 Writer. |

\* On service only. In peace time the command is attached to that of the Assam Elephant Troop.  
Annual Cost of the Corps—Rs. 1,25,328 (exclusive of Officer.)





## PACK BULLOCK CADRE SUBDIVISION.

(Four Sections in the Subdivision).

No. XIV.

| UNIT.<br>Carries 10 Mds.                           | SECTION.<br>Carries on "A Scale," ... 100 Mds.<br>" ... 108 "                                                                             | SUBDIVISION.<br>Carries on "A Scale," ... 400 Mds.<br>" ... 438 "                                                                                                                                     | To complete the full troop of 5 Subdivisions, viz. 1,200 bullocks carrying 2,000 Mds. on the "A Scale," or 2,400 Mds. on the "B Scale."                                                                        |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 Drivers and<br>6 Bullocks<br>5 Loaded<br>1 Spare | 1 Duffadar.<br>20 Drivers, (2 spare.)<br>54 Bullocks.                                                                                     | 1 Jenadar, 1st Class.<br>4 Duffadars.<br>80 Drivers (8 spare).<br>1 Assistant Salutri (cadre sub-division only).<br>1 Farrier.<br>1 Saddler.<br>1 Moonshi (cadre sub-division only).<br>218 Bullocks. | 1 Lieutenant.<br>4 Jenadars, 1st Class.<br>16 Duffadars.<br>360 Drivers (including 40 spare).<br>1 Salutri.<br>4 Farriers.<br>4 Saddlers.<br>1 Writer.<br>982 Bullocks (including 110 spare as per foot note). |
|                                                    | DETAIL.<br>With 100 mds. stores, 50 bullocks<br>" Baggage of 21 }<br>men @ 10 }<br>seers=5 mds. }<br>10 s., 2 M. B., }<br>Tents, 2 mds. } | DETAIL.<br>With 400 mds. stores, 200 bullocks<br>" baggage of 87 }<br>men @ 10 }<br>seers=21 m. }<br>30 s. 8 M. B. }<br>Tents, 8 mds. }<br>Jenadar<br>Salutri and medicines 1 " 1 "                   |                                                                                                                                                                                                                |
|                                                    | Total 54 bullocks                                                                                                                         | Total 218 bullocks                                                                                                                                                                                    |                                                                                                                                                                                                                |

N.B.—Spare pack bullocks are not kept up in peace as they can always be obtained when required.  
In the field 10 per cent. are added, viz., 110 for the troop.  
Cost of this subdivision per annum Rs.—86,002.

**REGIMENTAL MULES.**

No. XV.

| Per Company.        | Per Regiment on half scale, i.e.,<br>for four Companies. |
|---------------------|----------------------------------------------------------|
| 6 Regimental Mules. | 24 Regimental Mules.                                     |
| 3 Drivers.          | 12 Drivers.                                              |

Cost per annum per mule—Rs. 144-8-0.

**ELEPHANT SECTION.**

No. XVI

| Section carries 90 maunds.                    | REMARKS.                                                                                                                                                                                                                       |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Duffadar.                                   | Elephant sections are an independent portion of the transport of each circle. In the field should a number of sections be collected together they would be formed into an Elephant Troop under an Officer specially appointed. |
| 6 Elephants (with Mahout and Coolie to each.) |                                                                                                                                                                                                                                |

Cost per annum of elephant section—Rs. 3,600.



## II.

### NOTES ON STALLIONS.

BY CAPTAIN G. GAISFORD, *B. L. Corps.*

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"It is of no use your looking at that, for it is a mare, and you would not be allowed to ride it on parade"—is a remark I have frequently heard, and I have always considered that it contained a most unwise restriction.

In most services stallions are prohibited, and the time has now fully arrived that the above quoted restriction should be reversed, and that stallions should be no longer permitted in the Indian Army.

They can never be trusted. A man may own a stallion which behaves admirably for several years, perhaps, and then suddenly it begins to squeal and show signs of fighting. Such an animal is no longer fit to ride on parade.

In these days, when troops are constantly moved by rail, stallions are a cause of danger and delay. In narrow confined places, where men must ride close together, they are always unsafe. In camp they are apt to break loose, and then they generally disturb every animal and man in the vicinity, and it is lucky if it does not end in a free fight and injuries. On service, when any secret, silent work has to be done, the whole scheme is liable to be spoilt by a stallion neighing.

With all these disadvantages, and others perhaps, they do not possess any real superiority over geldings and mares; and it would be to the gain of the service if nobody was allowed to ride an entire on parade. A mounted officer ought to be able to devote his whole attention to his men; his horse should never cause him a moment's thought. It is quite a mistake to suppose an Arab loses his spirit by being gelt. He certainly does not carry such a crest, nor such a sleek coat in winter; but his quarters fill out, and, six months after the operation has been performed, he is a much nicer and pleasanter horse to ride than ever he was before.

The price charged for castration in most large stations is far too high; the operation certainly requires care, but Rs. 5, or at the outside 10, would be an ample salutri's fee.

The native cavalry are now busy gelding their horses; but they ought not to stop at the horses; those mischievous little animals, the grass-cutters' ponies, ought all to be submitted to the knife. The trouble and confusion they sometimes cause is very great.

But of all the objectionable brutes a stallion mule is the worst. In keeping a number of these in their present state the Transport Department is a great offender. In the station I write from, Tal

F



Chotiali, there are several, more like wild beasts than tame animals, and almost beyond all control. This being a grass country the natives turn their mares out to graze, and the havoc these mules play, when they do get loose, can hardly be described. They stampede the mares for miles, and it is sometimes days before they allow themselves to be caught. The complaints from the zemindars are loud, but as long as mule stallions are kept they *will* break loose—chains will not stop them. The extra trouble they give to the muleteers must be witnessed to be believed.

If Government were to determine to employ no entires, in any capacity, they would be great gainers. In all horse-breeding districts there ought certainly to be a tax on stallions, only those being exempted which were pronounced fit for covering purposes. But before bringing this rule in there should be an ample staff of salubris distributed over the districts, who should, for some time to come, geld *gratis*.

Until some such measure is taken, that is, until all unsuitable stallions are removed, any rapid improvement of the breed of horses is impossible.

In this district the grand mares of the country are covered by worthless tattoos, but it is to be hoped that Government will shortly send a supply of suitable stallions.

TAL CHOTIALI, BELUCHISTAN.

### III.

## CAVALRY REFORM.

BY LIEUT. ESME-FORBES, *Adjutant, 3rd Madras Cavalry.*

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I THINK it is Colonel Denison, who, in his history of cavalry, somewhere remarks that each arm of the service has had its time of over appreciation or depreciation. At one epoch it has been cavalry, at another artillery, at the third infantry, which has been peculiarly prized and thought much of; nor can the first of the three complain that in the past it has been unduly neglected. Since the earliest days, when curiosity led men to the acquisition of the science of riding, pride has implanted in the bosom of horsemen, a sense of superiority over their brethren on foot. During the ages of Chivalry, all but villains and persons of low degree rode to battle, and the only portion of the army that was thought anything of was the cavalry. The great knights, however, with their esquires, their handsome horses and grand panoply of war, all went down before the hardy Swiss infantry, and from that time, till the cavalry of Frederic the Great of Prussia again showed what their arm was capable of, infantry ruled the military roost.

The immortal deeds of Seidlitz or of Zirthen have rarely since been equalled, though those famous leaders were followed at no great lapse of years by Murat, perhaps the best cavalry soldier of his century. After Waterloo, the long peace which reigned in Europe would seem to have had a depressing effect upon cavalry men, nor with the exception of the gallant charges of our heavy and light brigades at Inkerman, did the Crimean campaign afford much opportunity for cavalry action.

That arm appears to have got into the habit of sticking close to its infantry, and to have lost the impetuosity, the daring which had made for it all of its past history. It was left to the American mounted riflemen to show these qualities in their great civil war, but European cavalry still maintained their mediocrity, until the Germans, in 1870, once more made a dashing use of their horsemen, and astonished a world which had begun to look upon cavalry as an obsolete arm. During the Franco-German war, nothing excelled the manner in which the German cavalry performed their duties, whether on the march or during the battle. They enveloped the movements of the French armies with a net of patrolling parties, which penetrated several days' march in front of the main body, and kept it constantly and perfectly acquainted with every movement of the enemy. When ordered to charge, they did so with such effect as to completely disprove the maxim which had been beginning to be accepted as an axiom, that cavalry could not charge unshaken infantry armed with the breech-loader.

Meanwhile the French cavalry, which had been reposing upon the laurels gained for them by Murat, did nothing to counteract the vigilance of their opponents, never sent out a patrol, and contented themselves with marching in large masses along the roads. They executed, indeed, several charges with extreme gallantry, but always with unsatisfactory results. Since 1870 there has been but one great war, the Russo-Turkish of 1877-78, and that affords few lessons in cavalry action. The Turks had no trained horsemen, and those of the Russians were useless, and, except at the passage of the Balkans under Gourko, displayed much the same touching affection for their infantry as the French had done in 1870, and other nations not infrequently before.

The extent and range of cavalry possibilities still therefore remains an unsolved problem. Seidlitz was credited with the observation that nothing should be impossible for a cavalry soldier, but that dictum has gone out of fashion since his time. The action of infantry and of artillery has been constantly discussed, and it is pretty well known what can be done with both of those arms, and how to do it.

But with regard to cavalry we seem to be lamentably far off any such conclusion. Some authorities tell us that the day of cavalry on the battle-field has gone; others that we should seek for a pattern of real cavalry usefulness among the records of what the American mounted riflemen did, some praise the Germans, some the Russians, some the Boers. Which amongst this multitude of counsellors is right? They cannot all be, perhaps not a single one of them is completely. I hope that I shall not be thought over-presumptuous in offering my quota to the argument; my only excuse for doing so is that I am myself a cavalry soldier, so that anything which relates to the action of the arm I have the honour to belong to, naturally possesses great interest for me. I trust, therefore, that my readers will be kind to the faults of my paper, and will remember in extenuation of statements, which may occasionally appear dogmatic, that I have no pretensions to literary skill, and that to such an one it is extremely hard to prevent appearing egotistical, and perhaps sometimes impudent. The paper was also composed with the greater difficulty, since it had to be put together in the leisure hours obtained from the calls of duty during the past few months, and that continuous application was impossible, which might have deprived it of many of its angularities, and improved perhaps some of its arguments.

I take it that cavalry action in the field can be divided broadly into two parts, namely, first, the manifold duties, which fall upon it in its capacity of being "eyes and ears" to the army behind it, and which include scouting, raiding, and the thousand-and-one operations which enable it to harass the enemy and to give notice of his every movement; and, secondly, those of the battle-field, pure and simple. The former of these has of late years attracted the most attention, and the latter has perhaps not received as much as it should have. I propose, therefore to commence with a consideration of how much circumstances demand

or permit, of cavalry on the battle-field, because the question seems to me to depend a great deal upon its drill, *i.e.*, the formations in which it presents itself; and if it can be shown that improvement is possible in those which at present exist, the importance of the increased opportunities for cavalry action on the battle-field will be sufficient to demand that any new ideas which may be considered good enough should be grafted at once upon its system. What every cavalry officer must aim at developing in the action of his arm of the service is celerity and precision of movement, and these are as much requisite for success off the battle-field, as they are on it. There can consequently be no fear, that what is good for one may not be of equal advantage for the other.

The notion at present conspicuous in cavalry drill is that of presenting a force heavy enough to crash through an enemy's ranks; this, it may be said, is the single consideration. Squadrons are, consequently, formed in two ranks, and taught to "charge home knee to knee." Exactly the same theory, and practically very much the same formation, have been in vogue for some centuries, although, as age succeeded age, experience has thinned the depth of the attacking bodies. The Knights of the Middle Ages used several ranks; at the commencement of the Seven Years' War there were three, at its conclusion Seidlitz took away the third rank; on the ground that it added much to the confusion and nothing to the efficacy of the charge, and since that date cavalry have been formed in two ranks. The formation in which they at present move is consequently, with slight alterations as to distance between squadrons, &c., precisely the same as that in which their forefathers rode a century and a quarter ago. Now things a hundred and twenty years ago may have been managed better than they are now, but they were at any rate on a vastly different scale. This could best be realised by endeavouring to place oneself *tempore* 1760 or so, and comparing the state of tactics as they then were with what they are now. Frederic's infantry were the only ones in Europe that could drill at all as we understand the term, and their *chef d'œuvre* in the way of manœuvring,—and a remarkably difficult one it must have been to carry out,—consisted of marching in column to one flank of the enemy at a distance of a few hundred yards from him, wheeling into line, firing a few volleys, and then, since they were by that time too close to do anything else comfortably, charging with the bayonet. Skirmishers had not been dreamed of, infantry were encountered in large columns or squares, their attacking formation was a line three deep, and their muskets carried a distance of two hundred yards, and were capable of being loaded and discharged about three times in a minute. Similarly the range of the artillery of the period was restricted to seven hundred yards, the guns could be fired once in twenty seconds, and were by no means capable of being frisked about country in the able manner in which we see them now. Under circumstances such as these it is easy to understand the great deeds performed by masses of cavalry, and to see in the mind's eye

twenty battalions of Austrian infantry laying down their arms to a regiment of Prussian Dragoons as they did at Hohenfriedenburg or Zirthen's Hussars, keeping the whole army at bay as they did at Hochkirch, or Seidlitz winning Rossbach, and saving Zorndorf with his admirable horsemen alone. Those were days in which, owing to the small development of the power of fire as then attained, cavalry could play with infantry as a cat does with a mouse. They could sit down placidly at a few hundred yards off and watch the gambols of their victims until such time as a suitable opportunity offered for charging, and then they could swoop down upon them, and the unhappy infantry would probably not be able to give them more than one round before they were demolished by the surging waves of excellent horsemen.

But all that has changed now. The artillery are mobile, and can fire two rounds a minute or less, up to a range of three thousand yards; the infantry have expanded, and instead of stiff lines or vast squares, we find them in groups of skirmishers, armed with a weapon which gives them practically unlimited fire to over a thousand yards, and meeting cavalry by the simple expedient of standing, or lying still, and endeavouring to blow them all to bits before they can get up. Surely we could not have a much greater change than that between the conditions of the battle-field as they are found to-day and as they existed during the Seven Years' War; and it seems to be, therefore, high time that we did as our ancestors did before us, namely, look around and adapt ourselves to circumstances as we find them. It is absurd on the face of it to suppose that formations which did very well in Frederic's days are at all adapted to our own. The infantry officer, who ventured to attack now-a-days with his men in a line three deep, would, if he survived the experiment, assuredly be recommended for admittance to a lunatic asylum. Nor can cavalry imagine that they are any exception to the rules which necessitate change in everything mundane. They cannot afford to sit in Buddha-like contemplation, calmly letting the centuries slip by. They are confronted now with the Martini-Henry rifle, and other similarly murderous weapons, and they cannot expect to meet them with success in formations well-adapted at the time they were assumed to their work, but which are now an anachronism. The question is, with what can this old world drill be supplanted?

We see, as a matter of fact, that every improvement in firearms has been followed by diminishing the thickness of the bodies subjected to their influence. This is the natural and best method of avoiding loss, and by extending the line at the cost of its breadth; more men are placed in a position in which they can effectively use their arms. The principle has been so thoroughly carried out in the infantry that not even a rigid line is left, the first or "firing line" so called, consisting entirely of men preserving more or less the general alignment, but with distances of several feet between them. It is perfectly recognised that it is not the formation which most easily adapts itself to

keeping the men under the control of their leaders, but under a state of things in which the maxim that no closed body of troops can live under fire has been proved to be true, no other is possible. Practically, therefore, the only formation open to infantry under fire is that in lines in extended order. This formation they assume on reaching the zone of unaimed fire, which is supposed to commence at eleven hundred yards.

Now, although cavalry requirements are different from infantry in many respects, they are both alike in two important particulars, namely, that for the full development of their strength they must make use of every man, and that under fire they must assume some formation which shall enable them to reach the enemy with as little loss as practicable to themselves. With regard to this latter point, General Hamley says: "It is probable that in many cases cavalry

will find it expedient to follow the general tendency towards more extended formations, and to adopt against infantry and artillery an order for its front line assembling the advance of infantry skirmishers." Boguslavski speaking of the same subject says: "Prussian cavalry has for a long

time adopted the echelon formation of attack. The principle is correct, for the squadrons follow one another at intervals, one drawing the fire, and the next breaking in. But the present firearms are so quickly loaded that there is really no cessation of fire. You may, however, mislead infantry into dealing its fire with precipitation and want of regularity. The attack in skirmishing order seems to us here to be preferable to that of compact squadrons."

"Thus we will imagine the charge of a cavalry regiment to be executed as follows: Two squadrons in extended order throw themselves upon the infantry, two following at a trot, about 300 paces in rear. The leading squadrons rush at, or perhaps ride through, the enemies skirmishers, wheeling off before his masses or galloping past them."

"The officer commanding the two squadrons in close order, who with his trumpeter accompanies those in advance until pretty close to the enemy's infantry, sounds the gallop for his own squadrons as soon as those in front have felt the first effective fire, and makes his charge."

"This plan may be the most likely to induce the enemy's infantry to blaze in a hurry, thus affording greater chances of success to the real charge which follows. We repeat it *may* have this effect, but we are far from setting it forth as an absolute receipt for restoring to cavalry its old power in battle. At all events this appears to us to be the best method, particularly as the horsemen in extended order would suffer less than if they were in compact bodies."

"It has been demonstrated that infantry cannot move in close order under fire, and the attempt of cavalry to do so has several times met with ghastly failure. Take, for instance, the charges of Michel's and

Bonnemain's Cuirassiers at Wörth, or of the Cuirassiers of the Guard at Mars la Tour, anent which it was said that "the ground was extremely unfavourable to cavalry. Rows of trees cut down close to the ground, and deep ditches, impeded the movements of large bodies *in close formation*," with the result that they were well nigh annihilated where they stood. Moreover, as has been shown, at least two of the best tacticians of the day are agreed in the opinion that cavalry must assume some sort of extended formation if it is to face the breechloader with a fair chance of success; and I have no doubt that many more extracts of the same sort from the works of justly esteemed military authors, might be added if only I knew where to look for them. All this I think sufficiently proves the absolute necessity for cavalry attacks being delivered in extended order when under fire; and the following deductions made by the ingenious author of "cavalry Tactics" give some of the advantages which might be expected to accrue from it:—

"We know that with cavalry the effect produced is less a question of actual numerical strength than with any other arm. If even a small number of cavalry get well among a lot of infantry, they usually have it pretty much their own way. I remark this because a single rank squadron, extended at intervals of a horse's length, will cover as much ground as a whole regiment does at present, and with only one-eighth of the men. This is of no consequence, provided that that eighth, or its supports, can actually get among the infantry without being shot down on the way."

"Now suppose a battalion of infantry in line to be so posted as to sweep with their fire the ground in front of them up to, say, 800 yards, the ground being ordinary ground over which horses can gallop. Imagine this line to be attacked in front by a squadron of cavalry numbering 40 files, in single rank and extended order, what target would be presented to the aim of the defensive infantry? Such a squadron extended at intervals of one horse's length between the files would cover 144 yards. A target to represent a mounted soldier is generally made eight feet high and three feet wide. There would be, including leaders, serre-files, trumpeters, &c., say fifty of these targets distributed with tolerable regularity over the above space. Total area of targets, 1,200 square feet."

"Now let us imagine that the same position is attacked by infantry. We shall find that a distance of "400 yards from the enemy, which I take as the mean, the same space of 144 yards would be occupied by not less than 100 infantry soldiers distributed over it as a swarm line of skirmishers. The number 100 is probably a good deal under the mark. Targets to represent infantry soldiers would be six feet high by two feet in breadth, which would give a total area of target of 1,200 square feet, or precisely the same as the cavalry. This is a very rough calculation, and swarm lines of infantry are of different densities at different periods

of the attack ; nevertheless, I think it may be laid down as a general rule that cavalry extended at intervals of one horse's length will present about the same target over the same extent of ground as infantry in attacking swarms."

"But it will be said that by this calculation the infantry are taken as if they were standing up, whereas in practice they would take advantage of whatever cover they could find, and failing this, would lie down. This is quite true ; but, while remarking parenthetically that cover from sight is very frequently no cover from fire, I must remind my readers that no man can progress while lying down, and that when ever he wishes to gain ground to the front he is compelled to get up. He will run, of course, and he may also assume a stooping posture, and thereby endeavour to lessen the target ; but the fact remains that, if the position is to be carried, every man of the attacking force will have to expose himself at various times over every yard of the intervening ground."

"If the position is well defended it always takes a long time to bring a front attack (and with such only are we now dealing) to a satisfactory issue, during the whole of which the assailants are under a rain of bullets."

"Hours would probably elapse, and severe loss be experienced, before the infantry would be standing triumphant on the ground lately occupied by their opponents."

"Now the cavalry, if they choose to gallop out, would cover the same ground *in about two minutes*. If in extended order, it is not probable that, though exposed from beginning to end, their proportionate loss would exceed or even equal that of the infantry."

"Cavalry cannot take advantage of cover, or by any direct means shelter themselves from the shot of the enemy whom they are attacking. To counterbalance this disadvantage, they have one great advantage in their favour, of which nothing, except their own acts, can ever deprive them—I mean their immense superiority in rapidity of motion, a quality which, if properly applied, may be in the future productive of the highest results, and which the system under consideration is calculated to develop to the greatest possible extent."

"I have not, in the above remarks, alluded to the presence of supports, though they are, with cavalry, as with infantry, the essence of the whole thing, but in a different manner."

"The extended line which I have imagined would be followed at an interval of 150 to 200 yards by a similar line similarly extended, and that again by a third and a fourth, and more if necessary."

"Here the system of single rank doubling at one stroke the possible number of reserves, permits us to contemplate the employment of as many successive lines as may be deemed necessary to effect the object in view, and these lines will follow one another, as I have stated, at somewhat narrow intervals, and over the same



ground, or nearly so. To prevent misconception I will at once point out that an attack on infantry by single rank extended lines of horsemen is in this respect a different affair to charges of cavalry in their present formation, where it is an universally accepted principle that different bodies are on no account to follow one another in the same track. This is not only on account of the risk to the supporting lines of being involved in the defeat of the first, but also, since the introduction of breechloaders, because the ground over which they would have to move is certain to be much encumbered with the *débris* of those which have preceded them. In the above method of attack such objections would not exist. An extended single rank line, having no rigidity of formations, could not be disordered in the same sense as cavalry formed in two close ranks, and, if checked, would be picked up by the next line without throwing it into confusion; also the fallen men and horses of the leading line or lines would not only be fewer, but those following them, being also at open files, the men would have but little difficulty in avoiding such obstruction of that nature as would be in their path. There would consequently be no difficulty in using several extended lines in direct support of one another; and, although the leading line or lines would no doubt suffer, there would be every probability of those in rear arriving amid the enemy with their order and *morale*, but little if at all impaired."

"In the above example I took an extreme case, that of cavalry attacking in front a body of infantry acting on the defensive, and prepared to receive an attack. Rarely, indeed, would cavalry be called upon to perform such a feat yet I cannot but believe that when the ground is suitable—and remember that such as is now considered most unfavourable for an infantry attack would be the very best for cavalry—an assault undertaken in the manner I have outlined in which successive lines of Cavalry with opened files dash on like waves of the sea, to break on the defending infantry, contains in itself all the elements of success."

It will be seen that while the two first authors from whom I have quoted recommend extended order only for the leading lines, and preserve behind them the present solid formation for real work, the third proposes that all the lines should be extended, and (in another part of the book) lays down a reserve in close order solely for the purpose of being at hand should hostile cavalry shew themselves.

Neither Hamley nor Boguslavski, as far as I am aware, have a word of condemnation for the double rank formation as it still exists, although they are of opinion that its front should be protected by a line of "skirmishers." But this would seem to afford it very little protection. It has been proved impossible, or at least reprehensible, to move infantry supports and reserves in close order under fire, and it would seem logically to follow that the same must apply to attacking lines of cavalry. Boguslavski says the first line in extended order coming upon them "*may.....induce the enemy's infantry to blaze away*

in a hurry ;” but in another place he remarks that “ the present firearms are so quickly loaded that there is really no cessation of fire.” What good, therefore, would come of exposing a line of men, who were to do no real part of the attack? Their charge might undoubtedly flurry the infantry, whom they once got amongst, but their advance would not have screened the supports in close order behind, and experience warrants us in assuming that any body of troops which violates the deductions made from recent campaigns, so far as to come under fire in close order, will be pretty nearly certain to be put *hors de combat* before it reaches the enemy. I am aware that this did not ensue once, to wit in the gallant and successful charge made by Bredow’s brigade on the 16th August 1870, but in nine cases out of every ten it has, and the strong probability of its occurrence is one which it would be fatal to their success to leave out of consideration in dealing with cavalry tactics. At the present moment cavalry formations are in the same condition practically as they were in the days of Frederic the Great—they are all in stiff lines. The proposal to cover the advance of these stiff lines by a cloud of skirmishers (for that is what it comes to), makes the drill exactly contemporaneous with that of infantry as it was in the days of the great Napoleon. But that still leaves us nearly a hundred years behind the age. What is required is that cavalry formations shall adapt themselves to the state of things existing at the present time. Now one of the plainest facts which has been learnt at the cost of many thousands of valuable lives is, that no body of troops can act in close order under the fire of the modern breechloader. There can surely be no use in blinking the fact. If cavalry is to work at all on the battle-field it would appear that it must do so in extended order.

There would seem to be every reason why, if it did, its efforts should be crowned with success. The great deterrent to its use at the present moment is the well-founded fear of the extraordinary losses which its heavy formation enables the enemy to inflict upon it. With the introduction of extended order, this would vanish, cavalry could not lose more men than infantry do, and the probabilities are that its action would be attended comparatively with much less damage to itself. To this may be added the consideration of the loss it inflicted on the enemy, whom the new formation permitted it to reach.

To some extent this has been conceded in the cavalry regulations of various powers. Our own lay down that in attacking artillery extended order is “ advisable ” because of the heavy loss which “ modern rifled guns are capable of inflicting.”

The Austrians get a step further, and say that “ swarms ” are to be used, “ when attacking guns in order to suffer as little as possible from their fire ; or when attacking advancing infantry, when the object is rather to check their advance than actually to charge them, or to attract their fire,

Austrian Caval-  
ry Regulations.

so as to give greater chances for a closed body following in rear ; or when the appearance of cavalry only would be sufficient ; or when the ground would not permit the advance of a body in closed order."

The Cossacks charge in what is known as "lava," a formation similar to the "swarms" of the Austrians, or our extended order, and it was this method of attack which continually put to rout the French cavalry—as good as any in Europe then,—during the campaign of 1812. I mention this because I have seen it noticed with surprise that cavalry should think of engaging hostile cavalry in extended order. As we see it has frequently been done with success, and there should, therefore, be no particular reason why the feat should not be repeated. However, this is a branch of the subject which I will endeavour to discuss in another place.

The adoption of extended order as the formation in which cavalry would charge on the battle-field, leads to a few results which will have to be studied in considering the best normal formation from which to assume or relinquish it. Quickness in carrying out the movement will be more essential than ever.

Small units of command will be necessary to impart to the extended bodies the cohesion, the power of rapid manœuvring, some of which, it would seem, they must lose by abandoning closed formations (at least that result has ensued in the infantry, and it is fair to presume that it would also do so in the cavalry.)

"It is undoubtedly one of the consequences," says Major Home, "that flow from the use of modern arms, that troops once actually engaged can rarely, if ever, move to the right or left. Manœuvring under fire, always difficult, may now be deemed almost impossible ; once troops are really engaged it would appear that their movements must be either forward or backward. Fresh troops may be brought up from the rear to feed the fight in front, but such movements as those made by Massena at Wagram are at the present day impossible. As an example, at the battle of the Alma, the Russian battery was stormed by a confused mass composed of four battalions and a portion of a fifth.....This description proves clearly enough that manœuvres under a heavy artillery fire, even of old guns, much more so with modern artillery backed by breechloaders, are impossible. Who could have turned that body of men pushing on, either to right or left ? Similarly at St. Privat, the Prussian Guards, when attacking, could only advance, halt, or retire. Under the tremendous fire that modern arms enable troops acting on the defensive to pour in, all movements to the right and left are vain. He who gives the order is the next moment down, and another pushes to the front. It becomes, therefore, apparent that the actual success of operations in war must primarily rest on the action of small bodies, good previous strategical movements, a correct formation of the order of battle, a proper selection of the points to be attacked, will make the success, when obtained, of far greater im-

Précis of Modern Tactics.

portance, but the actual success must ultimately depend on the correct handling of small bodies." These deductions, although primarily founded on infantry experience, affect cavalry as well, and are extraordinarily favourable to the success of its action. In the first place cavalry have the advantage in being able to carry out such simple manœuvres as circumstances may demand at pace, and this renders it possible for them to do much that is perfectly impossible for infantry. In the second it is in "small bodies" that tactics are agreed, cavalry can now appear to most advantage on the battle-field. "Because in modern warfare the long range and destructive fire of artillery necessitates a scattered formation, there will be more frequent opportunities for those brilliant dashes of small bodies of cavalry, in which, by taking advantage of the critical moment, the cavalry of division so often distinguish themselves." (*Von Moltke*).

There is another consideration which has to be recollected, and that is that cavalry now-a-days, as much as at any former time, require to keep a reserve in hand. Home's criticism upon the proposals for attack made by Boguslavski, which I have given on a preceding page, is "that they make no provision for what is really the grand danger of cavalry, viz., being charged when the horses are blown by fresh cavalry, in which case the cavalry on the blown horses are perfectly helpless, and no gallantry or leading can save them;" also it remains true that in cavalry combats the side which brings up the last reserve will probably win.

The present double rank formation satisfies these conditions to a very unsatisfactory extent. It is helpless over bad ground; as has been remarked before, it presents cavalry to the enemy's fire in a mass perfectly certain to suffer from it terribly; extended order can only be taken or relinquished from it at the cost of some confusion and delay, more particularly when it is sought to rally, and the rear rank men have to get the covering of their front rank men; and it practically wastes half the number of men in the ranks. Now, move the rear rank back to (say) wheeling distance from the front rank, and appoint an officer to command it in exactly the same way as is done for the front rank, and these objections disappear. Manœuvring is twice as quick with single rank as it is with double: the men extend or rally without any confusion: it is not much hampered by bad ground: it presents a much less dense mass as an object for the enemy's fire: it makes use of every sabre: and it doubles the lines of attack and support. These advantages are capable of demonstration on any parade ground. They were practically and successfully tested in the internecine Spanish wars of 1833-34, and so far ago as 1833, and the succeeding year or two, the following remarks were made upon them by the Duke of Wellington, and others of our leading soldiers, this, be it remembered, at a time when cavalry had not half as much to fear from infantry fire as it has now. The Duke of Wellington wrote in 1833:

"United Service Gazette,"  
12th March 1833.

"Cavalry is essentially an offensive arm, whose use depends upon its activity, combined with its steadiness and good order."

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"I think that the second rank of cavalry, at the usual distance of close order, does not increase the activity of the cavalry. The rear rank of the cavalry does not strengthen the front rank as the centre and rear ranks do the front rank of the infantry. The rear rank of the cavalry can augment the activity, or even the means of attack of the front rank, only by a movement of disorder."

"If the front rank should fail, and it should be necessary to retire, the second or rear rank is too close to be able to sustain the attack, or to restore order. The second rank must be involved in the defeat and confusion, and the whole must depend upon some other body, whether of cavalry or infantry, to receive and protect the fugitives."

"I have already said that the rear rank can only augment the means of the front rank by a movement of disorder."

"This is peculiarly the case if the attack should be successful. In all these cases, the second rank at a distance sufficiently great to avoid being involved in the confusion of the attack of the front rank, whether successful or otherwise, could aid in the attack, or, if necessary, cover the retreat of the attacking party, and thus augment the steadiness and good order of the cavalry as a body; while, by the absence of all impediments from the closeness of the rear rank, the activity of the front rank would be increased."

"It cannot be denied that, till required for the actual attack, the less cavalry is exposed the better. My notion of the distance of the lines of cavalry was as much as a cavalry horse could gallop in a minute; the second line should pull up at a walk when the first charges, the third and other lines in column should deploy, or be used according to circumstances."

"I conceive that the one rank system would require a change not only in the discipline but in the organisation of the cavalry. If I am not mistaken, it would render the use of cavalry in an army much more general than it is at present."

Two years later, in 1835, General A. Bacon, wrote:—

"In one rank all movements are made with greater precision and more rapidity than in two."

"When Cavalry has to re-form after a charge, it is effected more readily and far quicker, for each man gets at once to his own troop, and if such formation be required under fire, the value of quickness will admit of no argument against it."

"I have tried this in presence of a superior enemy very frequently, and at times when hotly pressed, and under a heavy fire artillery and musketry."

"A charge in one rank will be more rapid, consequently more likely to succeed, than one in two ranks, because the horses are more at liberty, not likely to be cramped by the endeavours of the rear rank to get to the front, and the men will have a more free use of their arms; every one will do his duty; skulkers cannot so easily pull up and such are found in all armies."

"In advancing in line for any distance (and before an enemy you have rarely a fine open country), the intervals are never preserved between squadrons, and it frequently happens that a line of two ranks towards the centre becomes a disordered column; in re-forming, a rear rank is never sure of its telling off."

"In all columns I should form my second rank in a column in rear of my first, that is, as a second regiment, and this will always be easy by keeping, when in line, a distance equal to the depth of a close column. You may always close your lines if you think it desirable, and, when about to form columns, it is only to open your ranks, or, instead of a column of squadrons, to form on the centre a contiguous close column of half squadrons."

"Another great advantage in the system is that all your ranks are commanded by officers. Whenever you are asked for a squadron remember it is a troop, and if you send two troops they are two squadrons, and they become a proper command for a Major."

Lord (then Sir Hussey) Vivian's opinion was:—

"As to the rank entire system I am by no means certain that it would not be always a good thing, if on advancing to an attack, or standing in line, the rear ranks were to form a reserve at the distance, say, of eighty or a hundred yards. When so circumstanced they would be much better able to follow up an advantage gained by, or to repel a successful attack of, the enemy on the first rank. The fact is the second rank is but of little use but to fall over the first."

It would seem that these conclusions must be admitted to be perfectly correct. Colonel Kinloch in summing them up adds: "It appears that the effective strength of our cavalry may be greatly increased, if not fully doubled, by adopting the rank entire system;" and in another place, "rank entire may appear loose, and show more daylight" between the files, but is not in reality more loose; on the contrary, cavalry, accustomed to work in rank entire, will be found to be better closed up than with two, though the two ranks help to fill up better, and make them appear closer and more solid."

I give this latter extract because it meets the argument generally urged in support of the superiority of double to single rank formation, namely, that the latter presents a weaker line. There is, however, on the face of it, no reason why this should be; one line can go as closely locked across country as another; and the further development of the argument, that the rear rank help to fill up gaps in the front rank, seems fatal to the efficiency of the denser formation, inasmuch as it practically amounts to the confession that at the moment of meeting the charge, the line will be in single rank, or at least in a very disordered sort of double rank, in which much of the latter will have been absorbed into the former. I do not presume to speak on these points without having endeavoured to get such practical acquaintance with them as I could. I have very frequently drilled my regiment in single rank, and been present when others did so, and I concluded

from what I have seen that a cavalry corps formed in single rank is twice as handy as one in double rank, and should be able to walk round" it.

The adoption of the formation of two lines at wheeling distance, instead of two ranks at half a horse's length, would not, perhaps, require any very violent distortion of the rules at present laid down for manœuvring cavalry. All increasing and diminishing of the front would be exactly as now carried out, but the opportunity might with advantage be seized of giving up "fours," and returning to threes which would enable a much greater number of men to be dismounted when it was required to develop their fire and would not in the least interfere with the other drill.

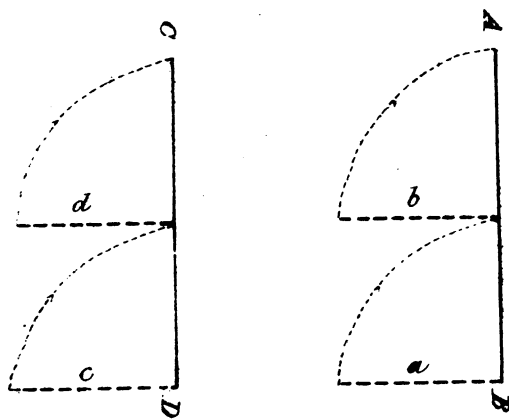
The substance of the following suggestions appeared in the "Army and Navy Magazine" for November 1882, under the heading of an article entitled "Cavalry Reform."

The squadron could consist of two troops as at present, and each troop of two divisions, and four sections. The only new thing about this would be the division, which is merely a name for each of the two lines, or ranks, into which the troop would be formed. There should be three commissioned officers to the troop, namely, one troop commander and two division commanders, which, together with the squadron commander, would give seven commissioned officers to the squadron. The division employed in the Indian cavalry of distinct squadron commands seems to be the correct one, and could be followed. The troop might consist of 50 privates with the proportionate allowance of non-commissioned officers, &c., they would present a front, extended at three yards distance of 197 yards. The number of trumpeters would want to be increased to three per squadron, namely, one for the squadron commander, and one for each of the troop commanders. These latter would only be required when working in extended order. Small columns could be formed of divisions, sections [=half a division], double threes (on the same principle as the double sections now used), and threes; these would give a front respectively of about 28, 14, 8, and 4 yards.

Preparatory to parade, the squadron could be formed in open column of divisions (*a, b, c, d,*) Figure 1. Each division could be told off by its leader, if practicable, one sergeant being placed on either flank, and a corporal as centre of division, the remaining corporal riding as division *serre-file*. The divisions would then be wheeled into line by the troop leaders, and the squadron would stand in two lines, AB, CD, at wheeling distance, its normal formation. In this, as in manœuvring, divisions would equal the present troops, and troops the present squadrons.

In line, the regiment would occupy exactly the same front as at present, but as in attacking in close order it would be advisable for the rear lines to echelon themselves on the leading lines, the whole front occupied could be roughly computed as double that occupied on

*Fig. 1.*



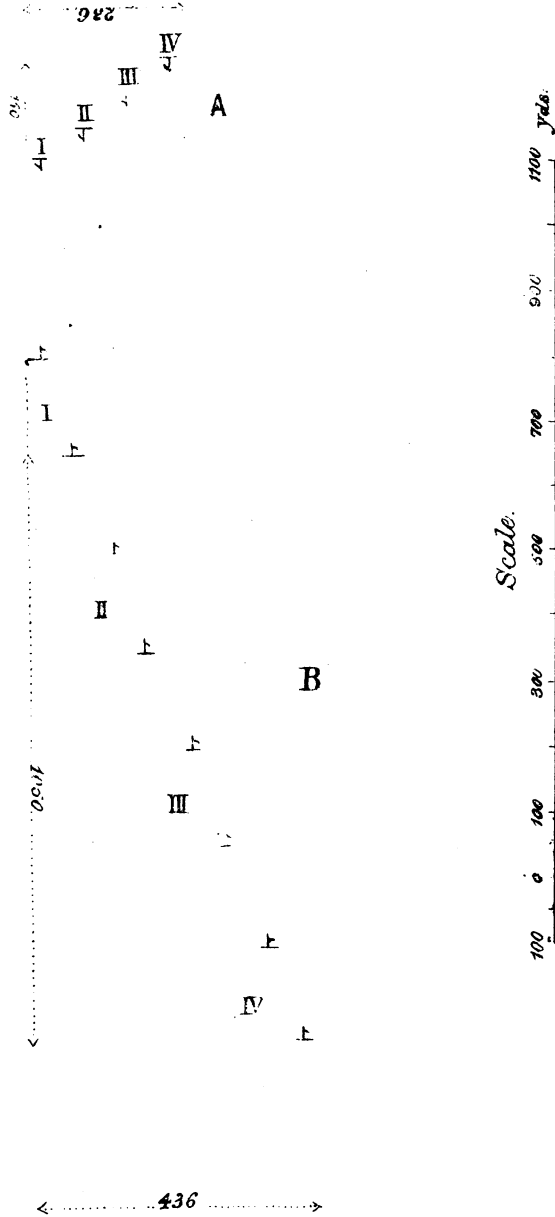
*Scale.*  
10 5 0 10 20 30 40 50 Yds.







Fig 2



the parade line. Similarly, as the distance between lines might be found to be best fixed at 150 yards (which can be easily galloped over in 30 seconds), the depth would come to about four times as much as the ordinary, or three times as much as what may, for clearness sake, be called the charging front. Thus a regiment of four squadrons of 50 files would occupy on the parade line a front of  $(50 \times 4 + 12 \times 3)$  236 yards, and a depth of 50 yards, the wheeling distance between troops. (See Figure 1). In charging, say, from a flank, the rear lines being all *écheloned* on the leading lines, the front would consist of that of eight troops (each troop being a line of a squadron) of 50 men, which, plus the 36 yards for squadron intervals, would give 436 yards; and the depth, consisting of the same lines with 150 yards intervals, would give 1,050 yards as the distance between the leading line of the leading squadron and the rear line of the rear squadron. Roughly, therefore, it might be calculated that, on the parade line, the depth of a corps would be a quarter of its front; and that on the charging line, the front becomes doubled, and the depth is multiplied by 20. The same general rules would guide calculations for brigades, or divisions, it being remembered that the depth of the charging formation will usually be three times as great as its front irrespective of a reserve held in hand.

This closed formation would primarily be intended alone for attacks on hostile cavalry, (since extended order is demanded against the foe, whose powers of offensiveness are commensurate with the accuracy and range of his fire), and, as such, I think it should go a long way towards securing those odds in its favour, which Jomini says are usually successful, namely, the possession of the last reserves. Imagine that two regiments of the same strength (4 squadrons of 50 files) attack each other, advancing in *échelon*, the one from the right, the other from the left. The former, which is formed on the principles now in use, will have a total front of 236 yards (as previously shown); and will present four consecutive bodies to the shock, each of a front of 50 yards, and the rear ones 50 yards behind the leading ones. The total depth of the formation will be 150 yards. On the other hand, the latter, which is formed on the principles I have herein endeavoured to explain, will occupy a total front of 436 yards, a depth of 1,050 yards, and will present consecutively to the shock eight bodies, each of a front of 50 yards, but at intervals of 150 yards (Figure 2). For convenience sake on the plate, I have named the force in double rank A, and that in single rank B, and have represented them as 600 yards apart. It will be seen that (calculating both sides or covering 300 yards a minute) the 1st squadron A and the 1st troop B will meet in one minute, the 2nd squadron A and the 2nd troop B in one minute 20 seconds, the 3rd squadron A and the 3rd troop B in one minute 40 seconds, and the 4th squadron A and the 4th troop B in two minutes. In the two minutes, therefore, A will have thrown in his four squadrons, while B has only thrown in two, and has two in reserve; of course A has double the number of men engaged, and in the *melée* this will tell in his favour, but B has got two squadrons absolutely fresh in hand, and this must eventually secure him an easy victory.

Moreover, I have placed B's squadrons badly for him, for the sake of making his superiority clearer. It would probably be the better plan for a single rank force always to attack with its rear lines in support on both flanks, since it could count on invariably overlapping a double rank force, and the supporting lines closing round the enemy after all his squadrons had been thrown into the fight should demolish him. Figure 3 will perhaps show this better. Two brigades of eight squadrons are engaged in exactly the same formation as in Figure 2. A will have thrown in his whole force against half of B's, and the third and fourth squadrons of B's two regiments should be sufficient, circling round the flanks, or bursting through the centre, to decide the combat. Perhaps it may be said that A would make more play with his squadrons than I have endeavoured to for him, but the result would invariably be the same, however he disposed them, for B would be acting on double the front of A, and with twice as many lines under his command.

To take extended order, the word "extend" (if the extension were desired from the centre), or "to the right" or "left extend" (if from a flank), would be sufficient. On this command the men would take up the increased distance by inclining outwards, or to the named flank as directed. Interval from knee to knee three yards. The division leader would ride out to three horses' lengths in front of the centre of his division, the troop leader to a similar distance in front of the centre of the troop. The sergeants would place themselves in front of the centre of their sections in the alignment of the officers, and the corporals an equal distance in rear. Each section would look to its sergeant, who would take the pace, &c., from the division leader, the division leader in turn being guided by the troop leader. To resume close order, the trumpet sound, or command "rally," would be enough.

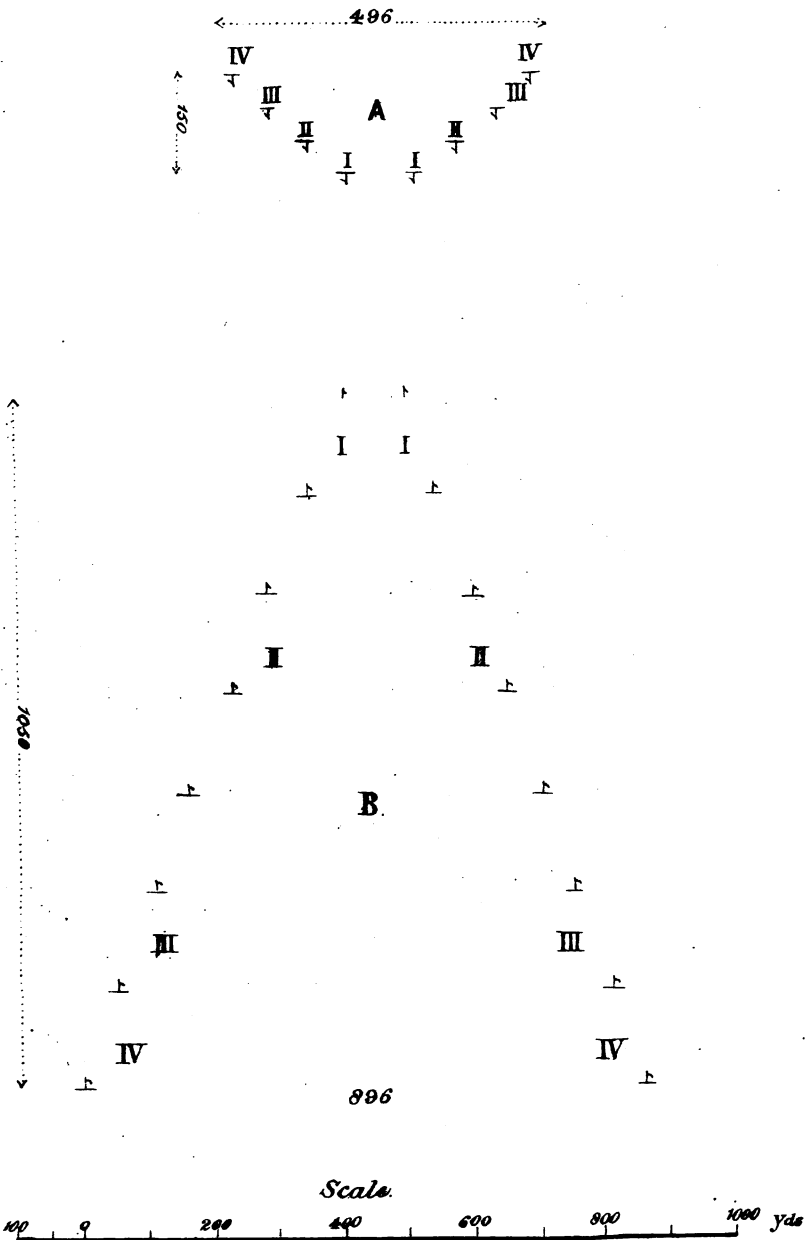
In extended order one troop (50 men) would occupy a front of 197 yards, or roughly, nearly the same front as the regiment on parade line.

Let us see how these principles might have been applied on actual service.

Modern Tactics. "On the 16th of August (1870), the French army was seeking to retreat on Verdun from Metz; a small portion of the Prussian infantry only was up on the south-west of the Verdun road, and it became a matter of the utmost necessity to pin the French to the ground, and keep them there until the remainder of the Prussian army could come up." (*Home.*) The action had commenced at 9 A.M., and about 2 P.M. Von Alvensleben, the Prussian Commander, finding himself very hard pushed by the advancing French infantry, ordered his cavalry to charge them. There were only present three squadrons of the 7th Cuirassiers, and three of the 16th Uhlans, so Bredow formed his brigade, and charged in one line, without supports. The result was eminently successful. "In a moment," says Borbstaedt, "the batteries were reached, and the gunners cut down at their guns, when the whole brigade...charged the infantry in rear, who received the

"The Franco German War."

Fig 3





rush of cavalry with a heavy fire. These lines were broken through too, and at such speed that few of the French had time to fire a second shot. The main object of the charge had been attained beyond all expectation, but carried away by the ardour of the combat, the impetuous band of horsemen swept irresistibly forward, despite of all endeavours of the officers to rally and re-form the men. The latter pounced on a line of *mitrailleuses* drawn up in rear of the infantry. Some of the foremost horsemen had reached the line of *mitrailleuses* with the last efforts of their horses, and begun to cut and stab at the artillerymen, when, quite unexpectedly, the French 7th Cuirassiers of Forton's Division issued forth from the wood on the old Roman road. One of its squadrons penetrated at once into the interval between the disordered Prussian squadrons, the remainder of the regiment and a dragoon brigade followed at a trot. At the same moment, French Hussars and Chasseurs, passing through the intervals of the second line of their own infantry, fell upon the right of the Uhlans, so that the six hitherto victorious squadrons, finding themselves attacked on all sides, were compelled to retreat, and with their blown horses to force a way through the enemy's masses of infantry. Of the 7th Cuirassiers only 7 officers and 70 men, of the 16th Uhlans only 6 officers and 80 men, came out of this sanguinary hand to hand combat. It is quite certain that the sacrifice demanded from the cavalry in a most critical moment of the engagement was repaid by the complete success of the manœuvre. For the fatal attack of the French 6th Corps against the left wing of Buddenbrock's Division was completely checked, and never resumed—a proof how much the French troops were shaken by the vehement attack of a few Prussian squadrons.”

There are several circumstances worth noting about this charge, of which the following would seem to be the most prominent, *viz* ;—

(1.) It was successfully “undertaken against intact infantry and powerful lines of artillery, neither of which had been previously shaken by artillery fire.” (*Borbstædt.*) The possibility of such a thing had previously been stoutly contested ;

(2.) The loss from the enemy's fire was insignificant, almost all of it was inflicted by the French cavalry with the *arme blanche* ;

(3.) A small force of cavalry again exercised an influence upon the result of the battle out of all proportion to their numbers ;

(4.) It was delivered in one line without supports ; and

(5.) The heavy loss experienced was due to this fact, which enabled the French cavalry to come up fresh to the encounter with their exhausted opponents.

Bredow, of course, had excellent reasons for attacking in one line ; he wanted to cover as great a front as possible, and to have advanced in more lines than one would have rendered it out of the question for him to have acted on any but a very small front. All the same, the result of the charge is only another instance in support of the rule



laying it down as a necessity that cavalry must have reserves in hand to meet possible contingencies. Now the single rank formation would have supplied him with these, and would consequently have very materially reduced the Prussian losses. Supposing that the six squadrons were composed of 50 file each, the front of the charge would have been  $(50 \times 6 + 12 \times 4 + 24)$  372 yards. Two single rank troops extended would occupy a front of  $(197 \times 2)$  394 yards, plus an interval of 12 yards if they were taken from the same, and of 24 yards if from different regiments, say approximately 400 yards; a squadron extended in one line would cover a front of 394 yards. The charge, therefore, could have been executed with two squadrons extended and four in support (Figure 4), or with three squadrons extended and three in support as in (Figure 5). Either plan would appear to possess material advantages over the one actually followed, for, while the extended lines would have thrown themselves upon the infantry and guns, the closed lines in rear would have been on the spot to cover their retreat, and to oppose any fresh body of hostile cavalry such as in fact appeared, and may in calculating the chances beforehand be generally expected to arrive on the scene.

The following account of a charge executed by the French cavalry on the same day I take from Clery's "Minor Tactics": "During the battle of Mars la Tour, at a moment when Bataille's Division of the 2nd Corps was being hard pressed by the Prussian infantry, General de Prueil was ordered to charge this infantry with the Cuirassiers of the Guard. He at once pointed out that the enemy's line was at such a distance that a charge had no chance of succeeding, unless the enemy was first shattered by artillery. An unqualified order to charge at once being repeated, he moved against the Prussians in three lines—two squadrons in the front, two in the second, and one in the third. The first line appears to have started off at a very rapid pace; for the second line, which the General accompanied, following at 150 paces, was ordered to slacken speed as the pace was too fast, so that the first line got considerably ahead. On nearing the enemy, the advance of the first line was suddenly checked by some hitherto unperceived obstacles. Inclining to a flank as they advanced, to pass these obstacles, the two leading squadrons were thrown into disorder, which increased considerably on receiving a heavy fire from the enemy at a short range. The leading squadrons came first on two Prussian companies deployed in line, who reserved their fire till the French had got within 250 paces. Its effect was murderous. Dividing to the right and left, the cavalry passed on wards, when the Prussian rear ranks faced about and kept up the fire. The French, continuing the charge, came on a battalion of the 12th Prussian Regiment, and in rear of that the 11th Brigade advancing between Flavigny and the high road. The effect of their fire was to strew the field with dead and wounded. The second line had now come up, and when at about 100 yards they received the order to charge, the Prussian fire emptied half the saddles. The third line still came resolutely on, but had equally to fall back again with similarly heavy loss. The

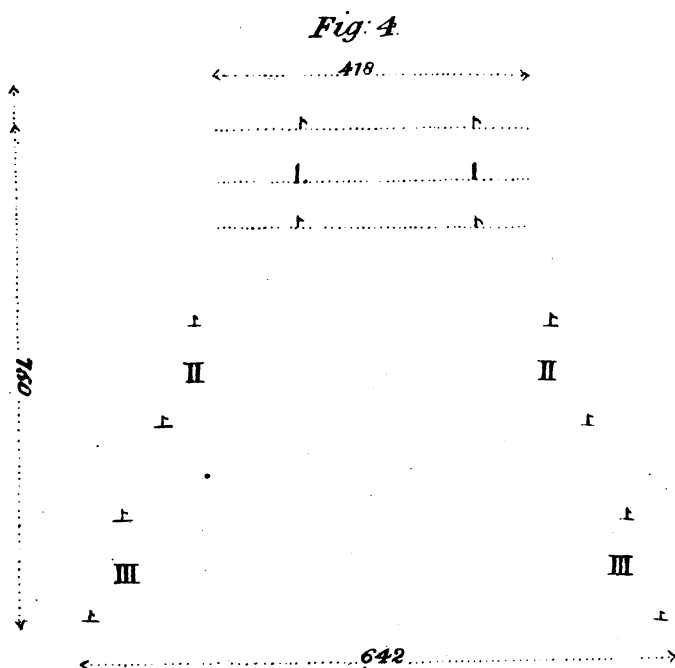
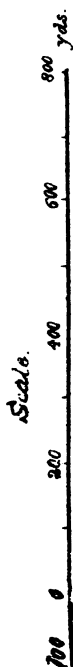
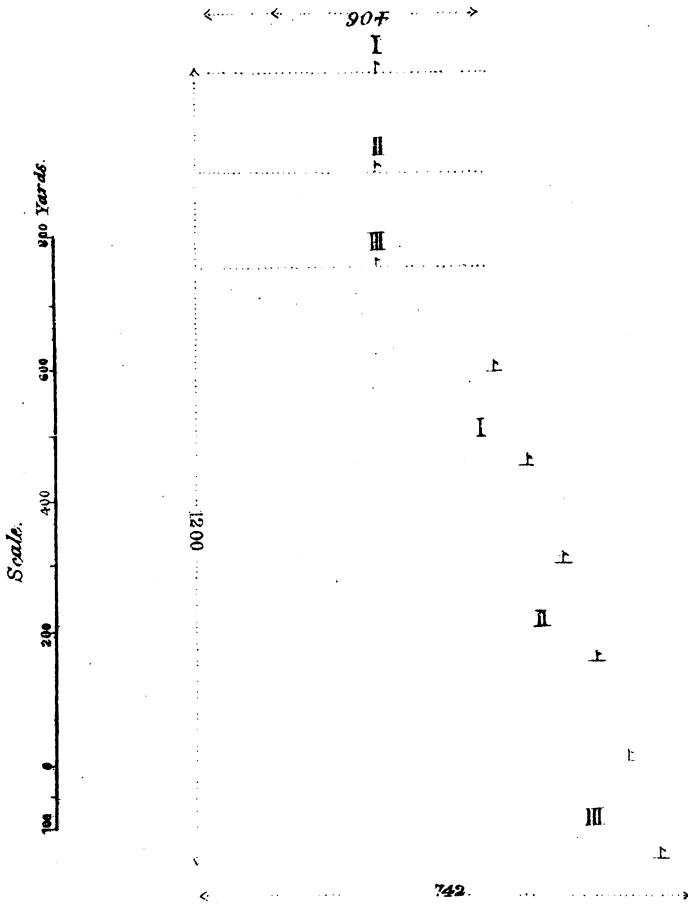






Fig 5



French loss is reported at 22 officers, 208 rank and file, and 243 horses. In this charge is perceived the loss that must ensue to cavalry by charging infantry in good order, and unshaken by artillery. Also the necessity for reconnoitring ground beforehand over which cavalry is about to charge."

In view of the fact that cavalry had just previously shown that it could ride over infantry, which had been untouched by artillery fire, that last "must" would perhaps have been better qualified. But apart from this, it would seem that the charge failed because the pace was bad, there was no mutual support amongst the lines, the squadrons were hopelessly bothered by bad ground, and, in fact, do not appear to have charged at all. Riding up to, and round the enemy, as, according to Clery, the French Cuirassiers did, could not have enabled the most sanguine amongst them to anticipate victory. The bad ground was the beginning of their troubles. If they had been in extended order, this would not have thrown them into confusion, and the effects of the Prussian fire would not have been half as severely felt. The actual successive front displayed by two squadrons of 50 file each would have been only 112 yards.

One troop in extended order would have given a much greater front than that, and either of the formations shewn in Figures 4 and 5 would seem to have afforded chances of success not offered by those employed; as matters happened the charge effected nothing at enormous loss; at the worst, this last consideration would have been absent.

The two examples I have given are the best I have been able to find in recent wars. The choice is circumscribed, because up till 1870 the breechloader had not appeared on the battle-field, and then it was quite a new introduction, and neither side knew to the full the extent of its powers; these were subsequently to be learned from severe experience. There are of course hundreds of familiar examples before 1870, but I have not glanced at them as they are useless to show us how the breechloader is to be met, the present problem for cavalry. In 1877, the Turks appear to have had no cavalry worthy of the name, and, with the exception of the Cossacks, the Russian cavalry seem throughout the campaign to have been beneath contempt. Nor, I believe, did even the famed Cossacks do much to keep up their reputation except during Gourko's raid through the Balkans. But turning from what has been to what may be, we find a good many opportunities for cavalry recognised, very few of which have as yet been acted upon.

"For instance," says Home, "a battle under existing circumstances is a series of small battles or fights in which bodies of troops, perhaps not greater than a brigade, are engaged, and each of these bodies must be tactically complete, must work for one object, and seek to carry one point."

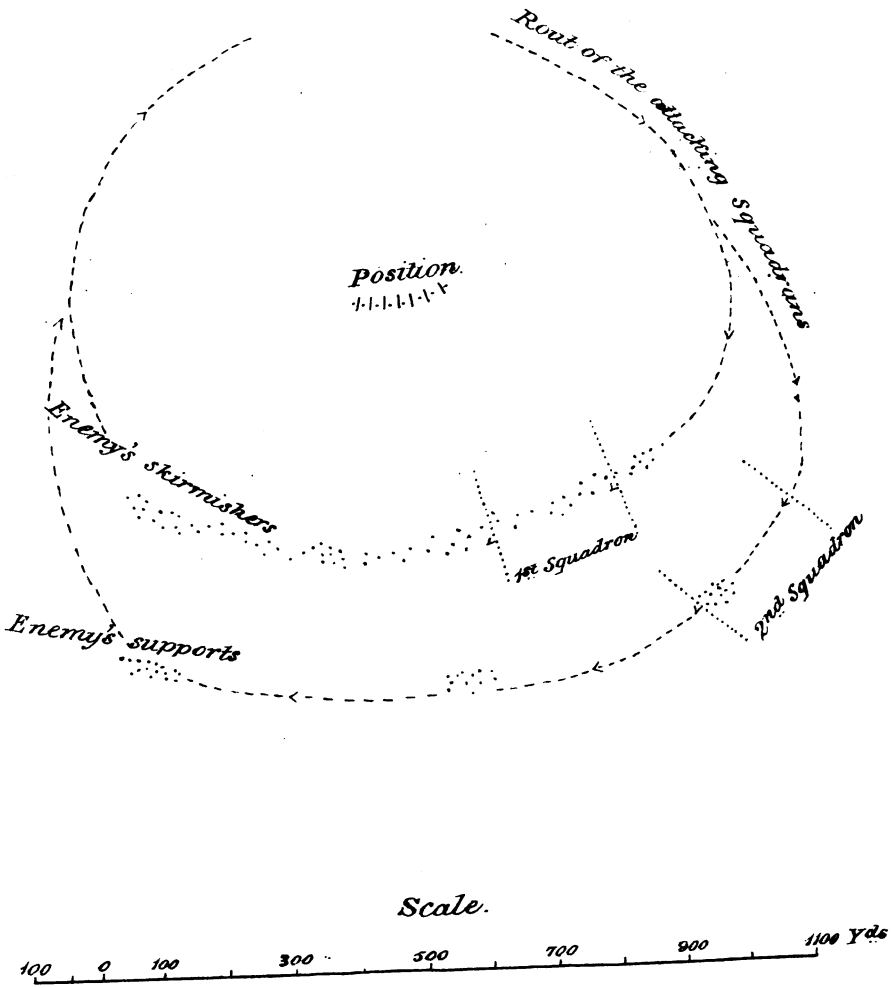
It is here that, as Count Von Moltke says, occur "frequent opportunities for those brilliant dashes of small bodies of cavalry." Again, says Home, "as the infantry advance, seeking to gain ground to the front in extended

order, they must not only be carefully supported from the rear, but as they are peculiarly liable to the attack of small bodies of cavalry on the flanks, cavalry must be held in hand, under shelter in some convenient place, with orders to watch any attempted action of the enemy's cavalry, and move rapidly to the front, if they show themselves. The cavalry must, in such a case, act by instinct and not by orders, and their leader must be most careful to watch lest, in the smoke and dust, the hostile cavalry move to the front without being noticed. In such cases, it is of great advantage to get as near the enemy as possible; often a small wood, or enclosure, will offer itself, or some fold of the ground, behind which the cavalry may shelter themselves unseen, from the enemy's position, and remain in readiness. The approaches to such places may be over ground heavily swept by artillery, and even musketry fire, but which it is quite possible to cross; so soon as a few infantry have got into the wood or enclosure, the cavalry officer may push some men rapidly out, riding fast a few men, in extended order, will usually escape; they may be followed by a few more, until the whole force is over. But cavalry cannot remain in such positions without the support of some infantry, who will prevent the enemy's infantry from making a forward movement with a small body and harassing the cavalry. In such positions, the cavalry must be prepared to venture everything to check a hostile movement." Or again: "Cavalry should be posted in the flanks and in rear of a wood, if opportunity offers, and if they can circle out suddenly, they may produce a great effect. If a small body of cavalry can be concealed in the wood itself, and pushed rapidly out, from the fact of cavalry not being expected, it may effect much, but this must be determined by the nature of the wood."

Under these circumstances, it would seem that cavalry would not have to go very far under fire, and that a small body would be just as, or more useful than, a large one. Very frequently also, they would be able to surprise the enemy's infantry, and they would certainly catch them at a time when they were violently excited, with their attention concentrated upon the infantry with whom they were dealing, and peculiarly liable to be thrown into disorder by the appearance of cavalry. A couple of squadrons let out amongst them as shown in Figure 6, the one taking the skirmishers, and the other the supports, would have a good chance of playing havoc with the infantry attack, and being back in their own position again, before the hostile cavalry appeared. Their formation, of course, could be varied in a number of ways depending upon the actual circumstances of the case.

Another chance for cavalry will be found in the fact that the heads of columns are now invariably formed of artillery, from which it results that that arm comes into action necessarily unsupported for some time by its infantry. An alert cavalry must have many opportunities of delaying and harassing, if not of actually taking some of the guns before they get into position. On the other hand the cavalry escort of the guns should have their work cut out in seeing that their

Fig 6







charges are not annoyed. Hence actions of cavalry against cavalry, or of cavalry against artillery may occur. I have already treated some considerations dealing with the former, and glance at the subject again later on; for the latter, extended order has received the sanction of our Cavalry Regulations of 1876.

Further opportunities are found for the cavalry of the attack, when the enemy's position has been won, and he is falling back from it, or for the cavalry of the defence, when the position has been taken, and the enemy's disordered masses swarm into it. At such moments, it would seem absolutely certain that the appearance of cavalry must have enormous effect; the infantry are in both cases demoralised, they have probably had a long and severe struggle, their nerves are at the extremest tension, and their order necessarily very much broken. Retreating infantry have always been supposed to be fair game for cavalry; but it is a question whether in this case, the victorious infantry, who have just gained the enemy's position, would not afford even better object of attack. They will be inextricably mixed up, different battalions being all represented in the line, they will have lost many of their officers, and will be, in fact, in much greater confusion than the beaten infantry who are retreating, provided that the latter are fairly good. It would be unaccountable how such opportunities for cavalry action can have been missed in the past, were it not for the supposition that they have not been seized because of the fear of the enormous loss which would ensue to cavalry charging thus in their present dense formation. But, in extended order, there would be no such loss, and I believe that charging in lines of extended order, cavalry will be able to convert a defeat into a rout, or momentary success into complete failure.

Again, to quote Home once more: "Cavalry will be of great use in 'turning' movements, for, it may be possible, from the more rapid movement of that arm, to throw an overwhelming force of cavalry on the rear of the threatened flank; the moral effect of a force of cavalry appearing there would undoubtedly exercise great influence on the stand made by the troops attacked, who would find their ammunition columns, &c., assailed and taken in rear by the cavalry, while they themselves were being pressed in front."

Happening, some time ago, to come into possession of Captain Nolan's well-known book, "Cavalry, its History and Tactics," I was much struck with some accounts he gives there of cavalry beating hostile cavalry by eluding its charge, and falling in "swarms" upon its flanks. Those who have the book will find the subject treated of in Chapters IV and V, but for the benefit of such as have not, perhaps I may be permitted to give two extracts. The following affair occurred during the campaign of 1812 in Russia: "The Cossacks fell on, and were received with a discharge of carbines; the French did not draw swords. Their fire, at first, sent the Russians to the right about; and whilst they were re-forming,

the enemy wheeled into column and opened out, so as to get their intervals wheeled again into line. We expected they were about to charge, but their object appears simply to have been to extend their line, and prevent their being outflanked; a common mode of attack with the Cossacks..... Several squadrons were told off to attack the enemy in flank and rear during the conflict. All these orders were steadily obeyed; they pressed in upon the French, and surrounded their squadrons. Here I saw myself, many of the French dragoons cut down or speared after firing off their carbines, before they could draw their swords. The French steadily defended themselves at first, as well as cavalry standing still can do, against such active adversaries, who swarmed about them on all sides; however, presently, some of them turned, and their example was soon followed by the remaining squadrons. The reserve, instead of advancing to restore the fight, joined in the flight, in a short time every one was galloping towards Jacobs-thal, and the entire plain was covered with scattered horsemen."

Of course, it will be said of this occurrence that no cavalry would now-a-days stand still to receive a charge from hostile cavalry, and I am aware that it would be most unsafe to build upon the chance of their doing so. However, I believe that on one momentous and unfortunate occasion in Afganistan, cavalry were found to fire from their saddles at the enemy, themselves being halted the while; and, how far the present preference of the carbine over the *arme blanche* may eventually carry cavalry, it would at present be premature to predict. "Many more striking examples of the superiority of the Cossacks as cavalry are upon record," adds Nolan, after detailing the above encounter, but unfortunately he does not give them. He does, however, cite the opinion of one or two celebrated French soldiers to the effect that the Cossacks completely paralysed the action of Napoleon's horsemen. Such results as they did obtain were almost entirely due to the fact of their never accepting a charge in close order, but always "swarming" around their enemy. In the following instance, which occurred at Chillianwalla, vastly similar results were obtained by a like course of action, against cavalry, who did not stand still, but charged boldly upon their assailants. "The cannonade had not been of long duration, when a body of Sikh horsemen moved to Sir Joseph Thackwell's left flank, as if to get into his rear. He now ordered the 5th Native Light Cavalry (three squadrons) and the grey squadron of the 3rd Dragoons (Unett's) to charge and disperse them.....The charge was sounded, and Unett's squadron, in line with the 5th Native Light Cavalry, approached the enemy. The Sikhs commenced a desultory matchlock fire.....The 3rd, forcing their way through the hostile ranks, never pulled rein till they had got some distance beyond the enemy; Unett, who was severely wounded, found his men sadly dispersed. The few men around him, with clenched teeth, essayed to cut their way back. The Sikhs opened out, and giving the dragoons a passage through them, abused, spat, and cut at them. The other parties, under their officers, the gallant Stisted and Macqueen, repassed the enemy as they could. The casualties in this

squadron were not less than forty six. Nolan does not give this instance as an argument in favour of the "swarm" or extended formation, but merely in support of his theory that our regulation cavalry swords are not as good as they might be, or perhaps he might have made more of it from the former aspect. Both Sikhs and Cossacks, however, were perfectly untrained in the recognised European methods of conducting cavalry combats, yet from that very fact they not infrequently managed to snatch the victory from their opponents. It does not follow that untrained cavalry are, therefore, the best; but it may very well, that if a new or unexpected method of action is pursued, the party sufficiently adventurous to make use of it will reap great advantages. The fact has been proved on a large scale by Frederic the Great, and Napoleon I (amongst others), whose successes were primarily due to their introduction of manœuvres, which had not previously been dreamed of. Now there is nothing new about the "swarm" formations, which have been extensively followed by the horsemen of various countries; owing, no doubt, to continued and "steady" drill being unnecessary to attain to moderate proficiency in them; but they present the other advantage of offering a form of attack, or resistance, to the civilised enemy which will be unfamiliar, and accordingly puzzling, to him. The action of cavalry, as still understood amongst the nations of Europe, consists entirely in presenting a heavy body, which shall give the greatest attainable amount of shock; so long as hostile cavalry meet this by opposing as much of the same quality as they can command, their encounters resolve themselves to a great extent into affairs in which the long odds are that the heaviest men will be successful. But if, instead of meeting, they can elude the shock, and throw themselves upon the weakest points of their adversaries, namely their flanks and rear, the light men very materially alter the prospects of the engagement. This principle would, it should seem, be applicable to light cavalry in general; but peculiarly so to our Indian native cavalry, whose, *élan* is hampered by a too close adherence to the regulations laid down for the guidance of their English comrades, and whose weight and (when they are sufficiently "irregular"), as a rule excellent control over their horses, render them particularly capable of acting in extended order where individual efficiency is demanded.

I hope I shall not be thought bumptious, if towards the conclusion of a series of observations which some will no doubt think sufficiently preposterous, I own that, to my mind, the training of cavalry, as at present understood, leaves much to be desired. It is based entirely upon the idea of producing what shall be as nearly akin as possible to a human battering-ram, and the consequence is that attention is paid to the concerted action of large bodies, while very little is given to the individuals who go to make up the whole. I do not mean that the cavalry soldier's education is neglected, for, as a Cavalry Adjutant, I have personally had sufficient opportunities of proving the contrary, and it might perhaps be more truly said that he is taught too much rather than too little. But what I do think is that sufficient attention is not given to those

parts of his education which will, in the day of battle, be most required. He is trained to fight knee to knee with his comrades, not by himself, when perhaps no comrade shall be near. For parade purposes, he is an excellent horseman, and he can use sword or lance with the elegance and precision which periodically calls forth the admiring comments of infantry inspecting officers. But can he turn, or pivot, or halt his horse, just as he may wish to? How often has he crossed swords, even in amicable rivalry, with the supposed foe? He is given many rewards for being a good shot, sooner or later he will get them for attaining average respectability in signalling, he is encouraged to aim at perfection in everything else, but as soon as he has passed out of longe, provided he can sit his horse in the ranks, and do the sword or lance exercises without making mistakes on parade, his education as regards riding and the use of his weapons practically ceases. Surely at this time, when he has reached a position of mediocrity as a cavalry soldier, every effort should be made to improve him, instead of allowing his education at the best to stand still. Any ordinary cavalry man can sit on a horse, and retain his seat and his dressing while he is borne along in the line of his fellows; there is nothing in the least extraordinary about such a performance. But if that is all he can do, he will be egregiously beaten when he encounters in the field the better trained horseman who cannot only maintain his position in a line, but is also perfect master of his horse, and can make it twist or turn, lie down or do anything that he wishes; who is accustomed to practise difficult feats by himself, and has established thereby that confidence in his own powers and that spirit of *camaraderie* with his horse which banishes from the minds of both the least suspicion that either will fail the other. It is laid down in paras. 865 and 866 of the standing orders for the Bengal Cavalry, that, "the object of the training of the Bengal cavalry should be to render the men masters of their horses and arms in every situation; to foster the individuality and intelligence of the men; and to accustom them to act independently and to rely on themselves. These objects may be best secured by limiting the amount of instruction in equitation, and squadron and regimental drill, to what is absolutely essential to enable a regiment to move in the field with steadiness, and a moderate amount of precision, and by practising the men assiduously at independent sword and lance play, both on foot and horse—back, at outpost duties, scouting, and patrolling." And it seems to me that this is the correct method upon which cavalry should be trained, and that the sooner the fact is insisted upon throughout our whole service the better it will be.

What there may be about our system of horse-breaking, which usually has the unfortunate result of spoiling every animal that is subjected to it, I am unable to say. I have seen hundreds of remounts commence their career in regimental riding schools, and have observed that they were then as a rule quiet, docile, and the possessors of snaffle mouths; and I think I may ask any one who knows him, whether it is not the discreditable fact that the average troop horse is a brute who

takes delight in shying at every conceivable thing, and has a mouth like iron? A percentage of horses in every regiment kick, struggle and break the ranks; a further number will not leave them when wanted to; another detachment bolt; and the number of really good horses who may be depended upon to betray none of these vices is much smaller than I should suppose it ought to be. The Boers and Cossacks are persons upon whom we look down with contempt, but they can stop a horse at full gallop, and fire off his back, or make him lie down and fire over him, with a touch which the animal perfectly understands, and readily obeys. The Cossacks can dismount and remount their horses at a gallop, and do a variety of other things which I shall perhaps be accused of romancing about if I enumerate, since I have not seen them. I presume, however, that they can be easily done if the attempt is made in the right way; and that being the case, I do not see why we should not do them. The usefulness of cavalry depends to a large extent upon the docility of their horses, and some system would, therefore, seem to be required which shall imbue all our troop horses with this characteristic, and as many as possible of our troopers with the knowledge of how to encourage and develop it. Cavalry, in fine, I would urge, should not be regarded as if it were a sort of brick-bat, a compact missile whose component parts are not of highly elaborated material, which is easily made, and as easily replaced by another when it has been shattered on the object aimed at; but rather as the scientific corps which it is fast becoming, whose efficiency depends upon the thorough training of every man and every horse, and whose action will be the more brilliant in proportion as the intelligence, the courage, and the horsemanship of each individual are given opportunities of displaying themselves.

While these considerations apply with force to that portion of cavalry duties to which I have hitherto been devoting myself, namely, its action on the battle-field, they do so with still greater strength to its performance of scouting, raiding, &c., which I have left to the end of this paper. As I said before, there is an unanimity about these which is not found when the subject of discussion is the action of cavalry on the battle-field, and which therefore, perhaps, leaves less to be said about them. Every one knows, or thinks he knows, all about picquet duties, outposts, and such like things, and although they are not invariably well-done for all that, there are at any rate certain general rules affecting them, which are universally recognised as affording the pattern which should be followed, and which do not leave much for the most loquacious to add. But I trust I may be allowed to make a few remarks on a subject, which has been remarkably well threshed out lately, but which is not yet completely bare. It is generally recognised that cavalry must now-a-days be armed with fire-arms, and many opportunities will necessarily arise in the course of any campaign, on which they can use them with effect. This being the case, and dismounted action having become an important part of cavalry duties, it should follow (but it does not in our service,) that the drill and armament of cavalry should be such as to admit of the greatest attainable efficiency in this

department of their work. They should, therefore, have as good rifles as can be served out to them, and when the occasion demands, be able to put as many of these rifles into line as possible. As a matter of fact, they have only carbines which do not carry half the distance of a rifle, and they are unable to dismount ordinarily more than a quarter of their men, or under extreme pressure, and in the face of regulations, more than one-half of them. The former of these defects could be remedied by the issue of rifles to all cavalry, and the latter by some alteration in their drill, such as that I have suggested, of telling off by threes instead of by fours, which would enable them to dismount a greater number of men. It seems to me that the argument is all in favour of these alterations, and what may be the practical objections which, presumably, have hitherto forbidden their introduction, I do not know. The rifle does not weigh so very much more than the carbine as to make that a sufficient ground for not issuing it; and if it did, its increased range should more than compensate for the extra weight imposed, and which could be accounted for by taking off some other and less important article. The introduction of threes instead of fours would make no sensible difference in the present drill book, beyond that of enabling a more efficient fire to be opened when dismounted tactics were required by the occasion. It is undoubtedly necessary that a mounted reserve should be kept in hand when cavalry are acting dismounted, but the facts that only a quarter of his men are available for this duty, and that the range of their carbines does not cover more ground than can be galloped over in two minutes by a mounted enemy, are scarcely conducive to a cavalry leader's making perhaps as much as he might of opportunities afforded his arm of distinguishing themselves by fire action. Given long range rifles, and an increased number of dismounted men, and these opportunities could be used without hesitation, and with far better results. In threes of course, number 2 would hold the horses of numbers 1 and 3 who would dismount, and this system is in force in the Russian cavalry; with better broken horses than those we can at present boast of, there is no reason why one man should not be sufficient to control several more led horses, but I have suggested "threes" as what appears to be the easiest and best present improvement practicable upon "fours." When our horse-breaking arrangements have resulted in fostering virtue instead of vice in our troop horses, cavalry will be able to dismount a number of men that shall be really respectable without decreasing the mounted support held in readiness for their protection.

What theoretically should be another improvement would be, making the cavalry soldier carry his rifle on his back, and his sword on his saddle, but I believe that practically there are objections to this which have hitherto forbidden its introduction into our service. The Americans, however, in their civil war, always carried their rifles slung across their backs, and I understand that the same method is now pursued in the Italian cavalry, who also wear their swords strapped to their saddles, so that it is perfectly practicable. And since the cavalry soldier only requires his sword when mounted, and

his rifle when dismounted, this method of carrying those weapons should place them in their most convenient positions for him. As it is at present, his sword when dismounted is simply a nuisance to him, and prevents all freedom of movement. Of course, carrying a rifle on the back is no fun at the best of times, and is apt to become almost insupportable on a long march, but this might be obviated by having as at present a bucket, in which the rifle might be carried to ease the men when there was no likelihood of its being required. On the other hand, the rifle slung across the back affords a certain amount of protection from sword cuts, &c. At any rate it would seem that the best place for the sword is on the saddle.

But I am afraid I have already overtaxed the patience of my readers, and I will accordingly close with my best thanks to them for perusing this paper, and the hope that perhaps some of them will step out and pulverise its propositions.

BELLARY, 13th August 1883.





# METHOD OF APPLYING ORDINARY WRITING TO THE SYMBOLS OF THE MORSE ALPHABET FOR THE PURPOSES OF ARMY SIGNALLING.

THIS is a simple system of utilizing the Morse Alphabet like ordinary writing intended for the use of Army Signallers and others, who having passed through a course are anxious to remember that which they have learnt, but who from various causes lack the means of constant practice so essential for accurate signalling.

Similarly a man goes through a signalling class, perhaps with credit; he finds the Morse Alphabet easy enough to learn, but for want of practice afterwards how easy to forget! My object then is to show an easy and amusing way of keeping it up, by constantly writing notes, memos, postcards, &c., &c. (This I believe with regard to postcards is done by telegraph employés among themselves for the sake of secrecy, but they use the ordinary symbols which take up a good deal of room.) In every regiment there are plenty of signallers; let them scribble away amongst themselves. Small prizes might periodically be given to the man who could accurately and quickest make out, say, twenty lines of this writing and hand it in written in plain English letters.

To write the word **ARMY** which would be                    

letter being carefully kept exactly under and commenced invariably at the right top; by this means the commencement of each letter will be in a level line and easy to distinguish.

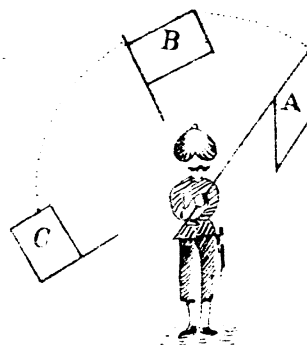
The thin or "up strokes" count nothing (same as the flag in signalling) ; they are merely for convenience in writing, and to shew termination of word.

For beginners ruled paper should be used.

As this little paper does not profess to teach signalling, but simply how to practise the Morse Alphabet on paper, I will only add that in telegraphing with a key a dot equals one unit, and is depressed as long as it takes to count ONE, a dash as long as it takes to count THREE, a space equals the time the key takes to rise.

It will be observed that in watching a signaller with a flag at work, he goes through my writing "in the air," so in writing try and imagine your pen the flag, and your long and short strokes from right to left his waves.

AHMEDABAD, 11th June 1883.



Wave flag from A to B and back to A = one dot  
 " " " A C " " " A = dash  
 After completion of message B "order arms"

Position of Signaller

THE MORSE ALPHABET

REMARKS.

1. Altered position of Dots and Dashes for writing as seen in Flag Signalling.
2. Same in writing dots and dashes of each letter connected.
3. Same shewing mode of connecting letters.

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | GH |
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## V.

### RUSSIAN MILITARY MANŒUVRES IN THE PROVINCE OF THE SIR-DARIA (JAXARTES).

[TRANSLATED FROM THE RUSSIAN OF THE VOYENNI SBORNIK  
(MILITARY MAGAZINE) BY W. E. G.]

THE formation of a Military Camp in the province of the Sir-Daria, for purposes of instruction, has not been possible every year, owing to the military and political circumstances which have so often summoned the Russian forces to the real business of war. Since the Khivan Campaign of 1873, in which nearly all the light troops of the province took part, camps of exercise have only been renewed with the autumn of 1874. During the two following years a portion of the Russian army of Turkistán was engaged in operations, in what was the Khánate of Khokand, but which is now the Russian province of Farghána. Hence it was only in the spring of the year 1877 that the possibility of assembling a force for military instruction once more presented itself. During the year 1878 the greater portion of the Russian army of Turkistán was concentrated on the frontiers of Bukhára for purposes of war. Political circumstances then changed, and the march across the frontiers of the Zarafshán district did not take place. Nevertheless the whole summer was lost to military manœuvres.

The year 1879 opened under the most favourable conditions with regard to the peace preparations of the Turkistán army. The quiet on the borders was complete. No sort of new political complication could be foreseen. The spring was early and warm. The Turkistán line battalions, which were equipped during the autumn of 1878, with small-bore rifles had, in the course of the winter of the same year, so far succeeded in making themselves well acquainted with their new armament as to continue a course of target practice, and to thoroughly ground themselves in all the minutiae of the formation of attack, so far as such could be carried out during the winter months.

The Turkistán Light Brigade, which has ever distinguished itself by its excellent military preparedness was assembled at the town of Táshkand. The Turkistán Sapper Company was well acquainted with its work both theoretically and practically, and was, therefore, quite ready for field operations. The Orenburgh, Ural, and Siberian Cossack Regiments, which had also been armed in 1878 with small-bore rifles, had, by paying attention during the winter to target practice, to long rides, and to various evolutions on horseback (*djigitovka*), thoroughly prepared themselves for field service. The artillery, after repairing, during the winter, their *matériel*, which, in the course of the campaign

of 1878 on the Bukhárán frontier, had become somewhat disordered, were quite ready to take part in the approaching camp of exercise.

It was under such favourable conditions then that the Russian Turkistán forces assembled on the <sup>1st</sup>/<sub>13th</sub> May on three points for instruction.

In Camp at Táshkand there were the 17th Regiment of the Line, the Light Brigade, the Sapper Company, four *sotnias* of the 1st Siberian Cossack Regiment, the *first* division of the batteries of the 1st Turkistán Artillery Brigade and the 5th Horse Artillery Battery of the Orenburgh Cossack Army. Total, 22 companies, four *sotnias* and 22 guns. In camp at Sámarkand there were the 3rd, 6th, and 9th Line Battalions, the 2nd Ural Cossack Regiment, the 3rd division of the Batteries of the 1st Turkistán Artillery Brigade. Total, 15 companies, six *sotnias* and 12 guns. Finally there were in camp at Petro-Alexandrovsk, the 8th and 13th Line Battalions, the 1st Orenburgh Cossack Regiment and the 4th Mountain Battery of the 1st Turkistán Artillery Brigade. Total, 10 companies, four *sotnias* and eight guns.

A less considerable spring assemblage had taken place at the town of Kátta-Kurgán, where the 5th Turkistán Line Battalion had been stationed for the winter. Soon, however, *i.e.*, on the <sup>28th April</sup>/<sub>10th May</sub> this Battalion marched out of Kátta-Kurgán, and started off through bukháran territory to Fort Petro-Alexandrovsk, whence the 8th battalion of the Line advanced to meet it, moving along the right bank of the Amu-Daria (Oxus), as far as the high lands of Chaharjui, and thence past the town of Bukhára to Kátta-Kurgán. This change of quarters of the two battalions was carried out very successfully. The battalions traversed about 650 *versts* (433<sup>1</sup>/<sub>3</sub>rd miles) for the most part outside Russian limits, and met with on all sides the most cordial reception both on the part of the local rulers and of the native population.

Such a change of demeanour is especially remarkable, because from the time of our appearance in Central Asia this is the first occasion on which our armies have passed through an unsubdued country without being fired at, whilst distant several *versts* from the capital of the Bukhárán Khánate.

Besides the above movements, there were some small gatherings of Russian forces during the past summer, *viz.*, at Fort Káزالinsk and also at Fort No. 2, Perovski, Turkistán and Julek. In these, however, no artillery took part.

On the occasion of the recent equipment of the whole of the infantry and of the cavalry with small bore rifles, it was necessary, during the year, to put them through a course of target practice, and to do so in rapid succession, yet not with undue haste. To this end the forces, which were enjoying pleasant weather, began the course on the <sup>1st</sup>/<sub>13th</sub> March, and, notwithstanding the novelty and the complex

nature of their task, the severity of the conditions of all preliminaries, and the want of acquaintance of every one with the working of the new rifles, results were attained during the past summer which can be termed entirely satisfactory. The Turkistán Rifle Battalions which, in former years, had not yielded in shooting to the best Rifle Battalion of the home forces, easily fulfilled all the requirements of the "new regulations," and gave, at the inspection of the practice carried out by the Commandant of the Rifle Brigade, an average result above "excellent." Thus, the 3rd Battalion was  $6\frac{1}{2}$ th per cent., the 1st Battalion 6 per cent., the 2nd Battalion  $3\frac{1}{3}$ rd, and the 4th Battalion  $\frac{1}{2}$ th per cent., above "excellent." And the inspection of the shooting held during the months of September and October, by the Commander of the forces in the province, Major-General Trotski, on the staff of the Emperor, showed that in the matter of shooting the Line Battalions, the Cossack Regiments and even the Local Battalions and Levies stand at the top of their profession.

The general result of the inspection of the practice of the Line Battalions and of the Cossack Regiments was above "very good," whilst some detached companies and *sotnias* gave results even higher than "excellent." For example, the Rifle Company of the 8th Battalion of the Line, (Lieutenant Kriloff's) was 12 per cent. above "excellent;" the second *sotnia* of the 1st Siberian Cossack Regiment (*Yesaul* Nudjevski's) was 11 per cent. above "excellent;" the 2nd Company of the 3rd Battalion of the Line (Ensign Charintseff's) was 9 per cent. above "excellent;" the first *sotnia* of the 1st Siberian Cossack Regiment (*Yesaul* Narbut's) was 7 per cent. above "excellent;" and the Rifle Company of the 6th Battalion of the Line (second Captain Simakoff's) was 6 per cent. above "excellent." The officers of the 2nd Ural Cossack Regiment also gave, at the inspection of the musketry practice results, when firing with rifles from the standing position, 4 per cent. above "excellent," and when firing with revolvers from horses, moving at a rapid rate, (*en carrière*) 19 per cent. above "excellent." One may, therefore, consider these results to be thoroughly satisfactory. The Cossacks of the same regiment obtained in mounted order, at a range of 100 paces, 49 per cent. above "excellent." This, too, may be estimated a very good result, looking to the novelty of the whole business.

Amongst the Local Battalions, the inspection of the practice gave generally less satisfactory results, with the exception of the shooting of some detached parties; for instance, of the Táshkand Local Corps, of the Kátta-Kurgan, Kodjand and Rjizansk native levies, the results of which may be classed as "very good."

Contemporaneous with the progress of the musketry course, in the beginning of May, the forces in all the camps were exercised by companies and *sotnias* in battalion, or field manœuvres, first over broken ground, as soon as they had reached the requirements of fixed rules for manœuvres of the kind. By the  $\frac{15\text{th}}{27\text{th}}$  July the practical course



of musketry and setting up drills by companies, *sotnias*, battalions and regiments were completed, so that after this date the forces were engaged in practising manœuvres over broken ground, one force against another, in constructing field works and in picket duties.

The manœuvres of opposing forces were at first practised by small bodies, such as platoons and half companies, then by companies and half battalions. They always terminated, however, with the formation of attack. The object of this instruction was to diffuse amongst the infantry and the dismounted cavalry regular ideas concerning the loose formation. Further, particular attention was given to training the connecting links and supports so as to rapidly and discreetly approach the enemy's position, to leading the men to acquire the habit of skilfully availing themselves of the advantages of the ground both when making rushes and when selecting positions for the delivery of their fire, and finally in putting the soldier in the way of making and repelling flank attacks. In order to convey a better idea of all these exercises the instruction was sometimes carried out after the issue of blank cartridges, so that no one fired except at a visible object.

The advance by rushes commenced by platoons at the longest range of rifle fire, *viz.*, 2,000 paces. This method is admitted to be useful, not so much in saving loss from the enemy's fire as in recognizing the necessity of stealthily approaching the position which is to be assailed. The attack itself or the final rush of the entire line of skirmishers and supports took place at a distance of from 100 to 150 paces. It always occurred suddenly on the command "hurrah!" without the enemy's previous knowledge as to the signal or sound for the attack, and it was invariably preceded by a short yet brisk fire. The instruction constantly finished up by a regular assault, upon which the line of skirmishers ran forward in loose order, making way for the supports to pass through them, thus avoiding the chance of crowding and collision. The principal requirement consisted in this that the loose formation should differ from the close not only in the extent of the movement but, above all, in the swiftness and smoothness displayed at every step, in the order and good aim of the fire, the regulating of which was entrusted to the several commanders. These requirements did not put out of view the different phases of battle array, since every problem, whilst based on an exact tactical formation, was carried out in groups or as they would be in actual warfare, the strictest attention being paid to the nature of the ground. It must nevertheless be observed that the various kinds of fire directed against marks formed by an enemy occupying a proper position is the best way of making an army acquainted with the requirements of the loose formation.

It was not long before there was received from the Military Department Order No. 154, dated  $\frac{5^{\text{th}}}{17^{\text{th}}}$  July, together with seasonable rules, for the instruction of companies and battalions in the loose formation. These rules did not call for any special changes in

the preconceived method already imparted, and they were therefore adopted by the forces with sufficient ease—the only difference being that instead of making an advance by rushes at a distance of 2,000 paces the same was commenced at a distance of 800 paces, and instead of a sudden rush at the double of the whole line of skirmishers on the command “hurrah!” the attack was developed with unbroken front at a foot pace accompanied with music and beat of drum.

The camp exercises of the Turkistán Sapper Company comprised the following:—

From the end of March the rank and file of the class of instruction continued the field operations which they had already begun earlier in the spring. These consisted in the dismantling of forts of both the simple and more complex kind: in solving on the spot topographical problems, and in applying to practice what had been propounded in theory during the winter months. The electricians were meanwhile engaged in their own practical work.

And at the same time there was inaugurated a course of instruction which always finished off with constructing shelter trenches for both infantry and artillery: these had to be made, according to the nature of the protection, in the space of from 20 minutes to one hour. The more complex kinds of fortifications, such as lunettes and redoubts were merely traced but not excavated.

The course of musketry for the Sapper Company was, in obedience to the new regulations, carried out as thoroughly as in the case of the regular infantry. Coeval with this course, there were carried on various instructions and operations of which we shall speak below.

From <sup>1st</sup>/<sub>13th</sub> August defensive siege and mining operations were initiated.

The first consisted in erecting lunettes with a double ditch, two tiers of rifle defences, and with a narrow entrance. The second, besides the making up of gabious, fascines and other materiel, comprised the laying down of portions of first, second and third parallels, betwixt which were traced passages of communication and the elevation of two batteries, the one for a dismounted gun and the other for a mortar. On each was placed a gun and a powder magazine. The construction of the mortar battery, together with the magazine, was begun and finished in the course of a single night, and all the conditions to be met with in actual warfare were duly observed.

The mining works comprised, besides clearing and repairing old galleries, the execution of two new ones, of an aggregate length of 28 running *sajens*.\* This work continued uninterruptedly day and night. The carrying out of practical works lasted till the <sup>2nd</sup>/<sub>14th</sub> November.

Just now experiments are taking place with regard to the explosive properties of nitro-glycerine as compared with gunpowder, but on this subject we cannot just yet speak of decisive results.

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\* A Russian *sajen* = 7 English feet.—*Trans.*

The Cossack Regiments, which returned during the end of May from the green pasture lands, were occupied till the middle of August with going through the musketry course, with working up the extended formation with manœuvring by *sotnias*, with field instruction, with sentry duty and reconnaissance.

The Artillery, both Foot and Horse, whilst the horses were out grazing during the month of April, were exercised in the preparation of plans and in other engineering works. When the horses returned to the batteries in the beginning of May, riding school exercises were commenced by section, and then by half batteries and batteries, at first over uneven country, and then, when these movements had been well executed, on broken ground. The latter part of the instruction had for its main object the correct choice and occupation of positions, the visual determination of distances, and the preparation generally of the batteries for the approaching practical manœuvres. In the 5th Horse Battery of the Orenburgh Cossack Army there was going on at the same time shooting from revolvers at a mark.

It had been proposed to commence these practical operations in the autumn on the receipt of the long range weapons, but since these weapons were not issued in time, the batteries began during the months of August and September, the practical course with the armament then in possession taking part at the same time in the complex manœuvres of the infantry and cavalry. The horse artillery, on the other hand, only began practical operations towards the close of September, by which time all their batteries had been finally equipped for service; they completed these operations by the end of October. In this way the annual practice of the artillery went on in all three camps almost at the same time. Furthermore in the camp at Tâshkand the batteries had the opportunity of firing at moving objects.

On the <sup>27th October</sup><sub>8th November</sub> an inspection of the batteries present at Tâshkand was held by the District Commandant of Artillery. In order to test the capabilities of the commanders of batteries, half batteries and sections in insuring the maximum amount of execution with common shell and with shrapnel, the shooting was conducted over unknown distances and under the most disadvantageous conditions for shooting. The locality selected was not known to the batteries. The dummies, representing an enemy regularly holding the position, were placed on such points as would be most favourable in the arrangement of that enemy's forces: in place of screens there were marks of the dimensions of one square *sâjen* (4,919 feet). The clear sunlight from behind and the undulating ground concealed the distance, and the erection of some of the marks in front of the ravines or behind the ridges of the rising ground hid the point of impact of the projectiles and also their line of flight. Notwithstanding, however, all these unfavourable conditions the practice altogether afforded excellent results: one battery shooting with shrapnel, and one section shooting with common shell at the 5th and 3rd round respectively got the exact range: three sections, one firing with common shell, hit the mark on the 4th, 5th, and the 7th rounds; and only one half battery,

shooting with shrapnel, failed to attain accurate results even after firing eight rounds; this occurred through mistakes made by its commander. The actual distances, as shown by the elevation of the guns, proved to be in the case of the practice of the 9-pounder batteries 900 and 1,020 *sajens*\* and in the case of the 4-pounder batteries 640 and 770 *sajens*\*. The practice with shrapnel was as a rule confined to a distance of about 700 *sajens*.†

By the beginning of August the entire force had finished its military instruction, according to the particular branch of the service, and it was further well prepared to enter upon complex manœuvres.

The first conjunct manœuvres of infantry and artillery, (the 3rd Turkistán Rifle Battalion, and the 5th Orenburgh Horse Cossack Battery) on the one side, and a detachment composed of all three branches of the service on the other (the 4th Turkistán Rifle Battalion, the 1st Battery of the 1st Turkistán Artillery Brigade, and the 1st *sotnia* of the 1st Siberian Cossack Regiment) took place in the middle of August at a distance of 20 *versts* (13½rd miles from the town of Táshkand, in the presence of Major-General Trotski, on the staff of the Emperor and commanding the force in the province. This manœuvre was carried out very boldly and confidently, and all who took part in it displayed on the occasion a good knowledge of the requirements of war. Following this there took place, also in the presence of the Commander of the Forces in the province, battalion drill performed by the 17th Turkistán Line Battalion acting as an enemy, moving at a distance of two *versts* (1½rd mile) from the Camp at Táshkand, on a locality which afforded much instruction from a tactical point of view. On this occasion the battalion showed that it had been well grounded in the loose formation. During this instruction the position of the enemy opposed to the battalion was marked with flags after the method which had been adopted during the preceding surrender in the Camp at Krasnogelsk. This was described in No. 142 of the "Russki Invalid" for the <sup>20th September</sup><sub>2nd October</sub> 1879.

On this occasion, in the presence of the Commander of the Forces in the province, there took place a general conjunct manœuvre of the entire forces in the Táshkand Camp. They proceeded to a point 10 *versts* (6½rd miles) to the north of the town, and worked over ground very suitable for the complex operations of all branches of the service.

The general idea of the manœuvres was to defend the town and to prevent its falling into an enemy's hands advancing from the north. Two problems had to be solved, for the solution of which the force were divided into two detachments: the Northern and the Southern: the first consisted of 10 Companies, 12 field guns and two *sotnias*: the second of 11 Companies, 10 guns and three *sotnias*.

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\* 2,100, 2,380, 1,493 and 1,796 yards respectively—*Trans*.

† About 1,633 yards.—*Trans*.

These two detachments formed the advanced guard of either combatant. That of the defenders had to force back the advanced guard of the attacking party, and to cut off its line of retreat until, at any rate, the (imaginary) main forces arrived on the field. The tactical object involved in this first problem lay in the attack and defence of the position.

Later on the development of the idea shewed that the advanced guard of the attacking party having been reinforced before it was too late began to press its enemy back towards the town of Tashkand. Thereupon the northern detachment received material aid in the shape of two companies and one *sotnia*. The tactical object of this second problem lay in the fact that the enemy retired after a fight with a foe of superior strength.

Both these problems were worked out in a thoroughly satisfactory manner, and the manœuvres closed with a general march past.

We cannot do otherwise than here direct attention to the complete vigour and absence of all fatigue in the forces engaged, notwithstanding that they, after being aroused at 4 or 5 o'clock in the morning, marched several tens of *versts* before the completion of the instruction, and that several *versts* of the entire distance performed were traversed in the rushes of the loose formation over very undulating ground.

In the camp at Samarkand, where there were present all three arms of the service, there also took place, from the middle of August to the close of September, manœuvres in which two forces opposed each other. In the beginning of October the Commander of the Forces in the province held an inspection therein; it was seen that all who took part possessed a very satisfactory readiness for the requirements of the field.

At all the conjunct instructions and manœuvres, and likewise at the course of musketry in which the camps of Tashkand and Samarkand attended, officers of the General Staff were present in the capacity of umpires. It was their duty also to test the tactical operations of officers in the field. Again, all operations were conducted under the immediate supervision of the leaders of the several portions of the force employed, so that in this way the officers were divided into several groups, and each group, under the superintendence of the senior officer, fixed upon a general plan of operations. This method of conducting tactical manœuvres in the field by officers who had taken part in like manœuvres of a preceding year afforded very satisfactory results.

In order to develop a spirit of self-confidence amongst the officers, and also to increase the attention of those engaged, the leaders of the several portions of the Force were recommended after making up a double company or *sotnia* from a whole battalion, to entrust, at these summer gatherings to the company or *sotnia* commander, the execution of some part or other of a practi-

cal problem, care being taken that it was accurately carried out on the general plan of the evolutions, and yet not necessarily according to prescribed regulations. These new recommendations were carried out so successfully that at the general inspection which took place during last October the required movements were, with rare exceptions, performed without a mistake. The double companies and *sotnias* they formed of individuals taken indiscriminately from the whole battalion carried out according to the personal testimony of the inspecting officer, the various movements and evolutions as well as the ordinary units are in the habit of doing. In order to make the several branches of the service more closely acquainted with each other, the same measures were adopted during the past summer in all the camps of the province as those taken in the course of last year in the case of the forces serving in the district of Wilna. These consisted in the movements of infantry through bodies of cavalry and artillery and *vice versâ*. This place of making the several arms of the service familiar with each other is very practical and certainly useful, especially if these several arms of the service seldom see each other, or, at any rate, only meet at instruction and field manœuvres. Of course for Turkistán the plan adopted has not any such importance, for these the infantry soldier so constantly sees, in close proximity to him, both cavalry and artillery, and thus he not only is not astonished at the movement of *sotnias* or batteries, moving at a foot pace through close bodies of infantry, but he does not blink his eyes when both cavalry and artillery rush close past him at a rapid rate. Neither does the artillery soldier's horse shy at the infantry soldier's, but rather regards him as one of its own species. The animal as it were knows that in a moment of difficulty the infantry soldiers will aid it in dragging the gun through some yielding sand or through some rocky defile. The Cossack's horse too is accustomed to the infantry soldiers, for has it not often carried him across swift mountain torrents,\* and does it not also remember that wherever infantry are quartered there to a certainty will it find both hay and barley and water.

Neither does the Cossack horse fear artillery or infantry fire. We have never yet seen a *sotnia*, as it dashed through a battery, either change its course or check its rapid pace on being met with an artillery discharge at a distance of from 90 to 120 yards.

Generally, indeed, it can be said that the Russian Turkistán forces know each other well, not only in a warlike signification but during times of peace. They are, moreover, complete strangers to any inharmonious spirit. Soldiers of all arms in Turkistán thoroughly enjoy the same status in society, and each knows to full that every member is a specialist, and above all that every one must band together

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\* No later than September 1878, the whole of the infantry of the Jâm detachment (10,000 men) were borne across the swift and very deep Zarafshân river on Cossack horses.—*Author*.

This was the force concentrated for operations against Afghanistan and India in case of the rejection of the Treaty of Berlin.—W. E. G.

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so as to form one indivisible and powerful *camaraderie*, pledged to uphold the dignity of Russia in the depths of Asia. It is needless then to add that an army composed of the several branches of the service, after traversing thousands of *versts* over steppes and mountain passes, and after collecting in time of peace in camps of exercise for six months in the year, cannot but thereby acquire a true martial spirit and be welded into one whole body ready at all times and seasons to die for glory, for Tsar and Fatherland.

# NOTICE.

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For the Gold Medal granted by the Council of the United Service Institution of India for the year 1882-1883, five Essays were received in competition, the subject being "The Volunteer Force of India.—Its Present and Future."

Three of these Essays, with their respective Mottos, were classed by the Referees nominated by the Council as follows :—

- I. "Mars Gravior sub pace latet," Author Major E. H. H. Collen, B. S. Corps, Officiating Deputy Secretary, Government of India, Military Department.
- II. "Pro focis et aris," Author Major C. A. Dodd, Commandant Allahabad Rifle Volunteers.
- III. "In Deo Confidentia," Author Captain F. R. Begbie, 1st Sikhs, Adjutant, 1st Panjâb Volunteer Rifle Corps.

The Referees further recommended that all three of the above Essays should be published in the Journal of the Institution.

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The Council have chosen as the subject for their Gold Medal for the year 1883-84 the following :—

"The best method of devising a system of reserves for the Native Army of India as at present organized."

The following are the conditions of competition :—

1. The candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 pages of the size and style of the Journal.
3. Essays must be received by the Secretary on or before the 1st May 1884.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the candidate inside.
5. The Essays will be submitted for decision to referees chosen by the Council.
6. The name of the successful candidate will be made known at the Annual meeting on the 1st June 1884 and his Essay will be printed in the Journal.

By order of the Council,  
W. E. GOWAN, MAJOR,  
*Secy. U. S. Institution of India.*

SIMLA, }  
December 1883. }









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